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Northern California's Computer Magazine

January 21, 1991 • 78

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MICROTIMES

**PATENT
#4,942,516**

The Inside Story

By Wayne Yacco

THE 4th ANNUAL MICROTİMES

100

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"This time last year, anybody who predicted, say, Gil Hyatt's patent on the microprocessor, or the return of David Packard, or Ashton-Tate's apparent loss of its crown jewels, wouldn't have found much of an audience. But 1990 was that kind of year."

Story begins on page 71

Southern California engineer Gil Hyatt, recently awarded a patent on the microprocessor by the US Patent Office, talks tech and tells tales

Story begins on page

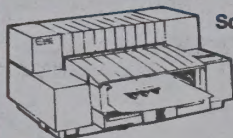




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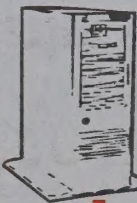


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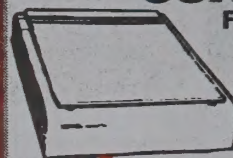


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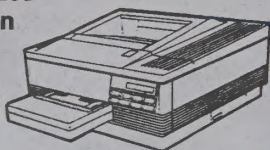
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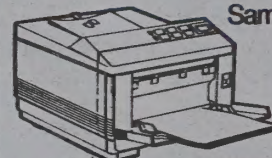
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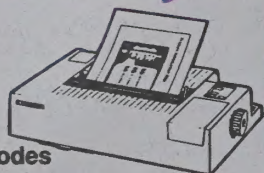
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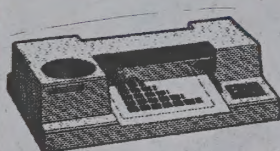
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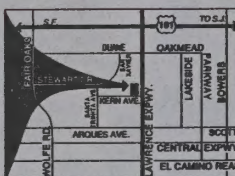
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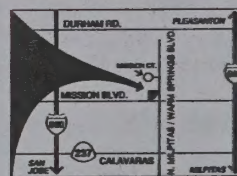
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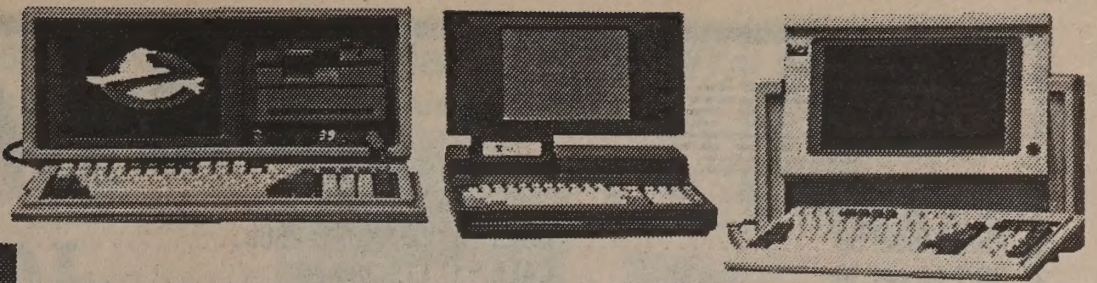
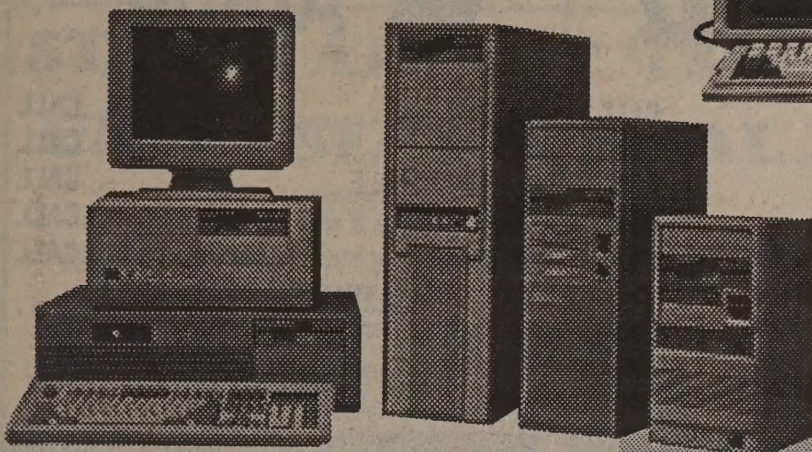
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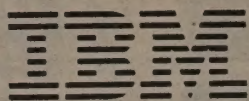
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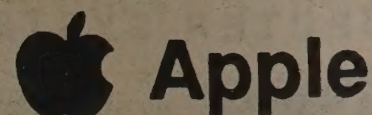
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 WordPerfect 5.1 249
 Q and A (3.0) 255
 Prof Write (PFS) 139
 Norton Utilities (4.0) 49
 Norton Advanced 99
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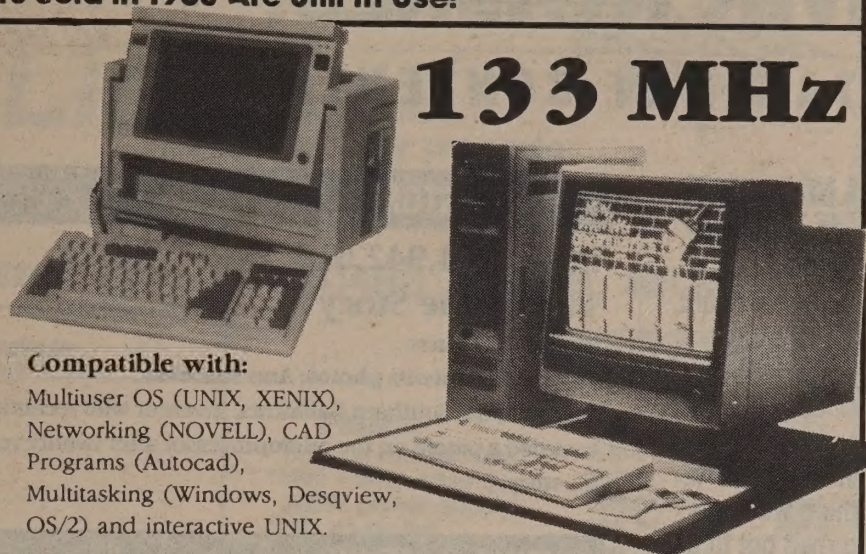


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TABLE OF CONTENTS

A NOTE FROM THE EDITORS:

1990 was, without a doubt, the strangest year we've seen since we've been around, the year in which everything we knew turned out to be wrong on a fairly major scale.

Consider our cover story subject Gil Hyatt, who confounded twenty years of conventional wisdom and convinced the US Patent office that he, and not Texas Instruments and Intel, had invented the microprocessor.

Or consider how often it happens that a long-retired company founder steps in to get the firm back to its roots and back on track—but this year, that's what 78-year-old David Packard did at Hewlett-Packard.

It doesn't happen too often, either, that a federal judge announces that a large software house doesn't own its flagship product, but that happened too.

We suspect this year might be just as unsettling. We also hope you will spend it with us.

—ME

COVER STORY

Patent #4,942,516 The Inside Story 58

By Wayne A. Yacco

Cover and contents photos: Ann Summa

Gil Hyatt, the Southern California, inventor who recently was awarded a patent on the microprocessor after twenty years, tells his story.

NEWS & VIEWS

Letters 14

Industry Insight By Paul Hoffman

1990 In Review	16
Windows 3	16
Hardware	19
Lawyers	22
1991: Fall Of The Titans?	26
High Tech News From Japan	232

Realizable Fantasies By Jim Warren 32

Who's listening to your cellular phone?

Dvorak's Last Column By John C. Dvorak 238

Dvorak declines to engage in year-end predictions.

BUSINESS SOLUTIONS

Slotless Expansion By Ed Kahn 39

Creating full-featured portable-based systems.

LANs By Wayne A. Yacco 47

Visually mapping your Mac network.

UNIX By Bennett Falk 52

Monitoring system activity.

The Fourth Annual MicroTimes 100 Our Annual List Of Industry Leaders— For A Turbulent 1990 71

It was a year of surprises for the computer industry, and our list of people who affected it reflects a certain amount of unpredictability.

FEATURES

Mac-DOS-XENIX Storage And Backup By Ari Davidow 134

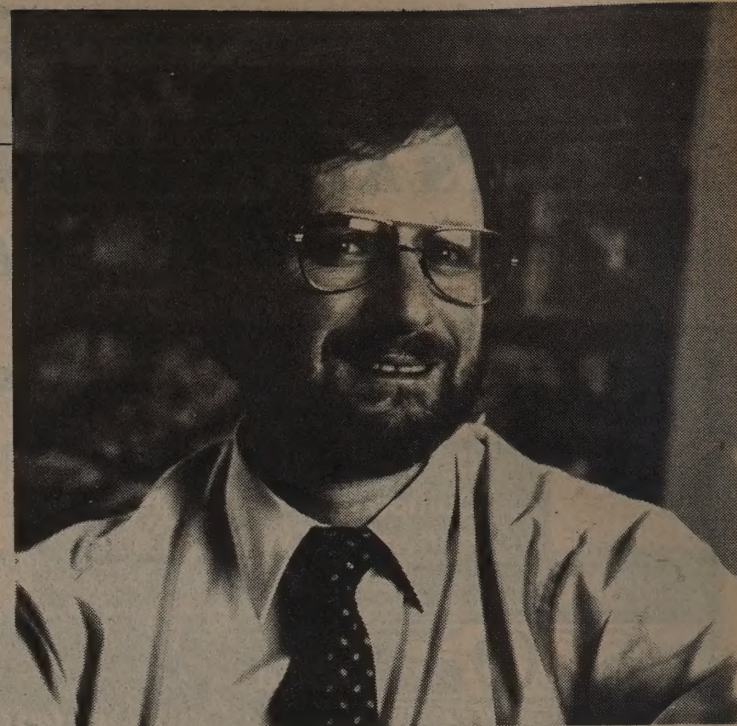
Cartridge drives for multivendor environments.

Buying A PC Clone By Paul Hoffman 138

Part II: Choosing features.

Prodigy: Where Is It Going? By Adam Gaffin 146

As the IBM-Sears venture begins its national rollout, it's having a clash of vision with a substantial number of its users. In a related excerpt from *Boardwatch Magazine*, Jack Rickard explains how GENie's benefiting from the situation.



When Worlds Collide: Scenes From The Japan Press Tour By Mary Eisenhart 154

Culture shock, trade show hell, neat technology, and other items of interest from the other side of the world.

PRODUCT SPOTLIGHT

Product Updates 160, 162

MacModem	160
LaserFrame Drive	160
PixelView I Monitor	162
C-Cube Compression	162
RasterOps Boards	162
Org Plus For Mac	162
ClickArt Symbols	162
Carbon Copy Mac NetPack	162
SwiftTax	166
PC Guardian	170
Outside In	170
Abacus II	170
Phoenix User Guide	174
Everex Tempo Notebook	174
ZEOS 286 Notebook	216
Micro Express Portable	216
Certify!	216
How To Use Lotus 1-2-3	216
Professor Windows	216

CREATIVE TOOLS

BMUG By David Morgenstern 186

Year-End Follies.

Amiga By Matthew Leeds 196

Hard disk utilities and other new products.

Atari ST By David Hawkins 200

Long-awaited products debut at COMDEX.

RESOURCES

Calendar of Events 204

Digital Color Prepress Seminar	204
Fifth Annual Computer Game Developers' Conference	206
Sixth International Conference & Expo:	
Multimedia And CD-ROM	208

User Group Network 210

Classifieds 218

Index of Advertisers 236

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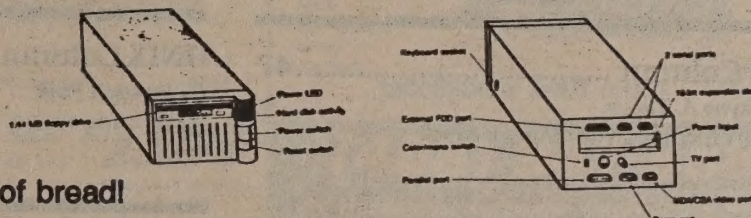
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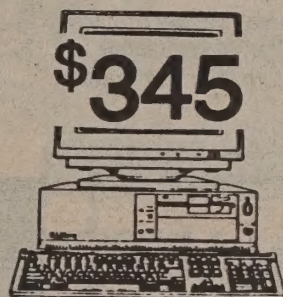
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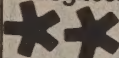
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PRODUCT-ORIENTED TABLE OF CONTENTS

As a service to our readers, we offer this alternative table of contents, with the information organized by product and machine type.

MS-DOS

Buying A PC Clone 138

By Paul Hoffman

Part II: Choosing features.

PC Product Announcements

SwiftTax	166
PC Guardian	170
Outside In	170
Abacus II	170
Phoenix User Guide	174

MACINTOSH

LANs 47

By Wayne A. Yacco

Visually mapping your Mac network.

**Mac-DOS-XENIX Storage
And Backup 134**

By Ari Davidow

Cartridge drives for multivendor environments.

BMUG 186

By David Morgenstern

Year-End Follies.

Mac Product Announcements

MacModem	160
LaserFrame Drive	160
PixelView I Monitor	162
C-Cube Compression	162
RasterOps Boards	162
Org Plus For Mac	162
ClickArt Symbols	162
Carbon Copy Mac NetPack	162

LANs

LAN Column 47

By Wayne A. Yacco

Visually mapping your Mac network

LAPTOPS

Slotless Expansion 39

By Ed Kahn

Creating full-featured portable-based systems.

Product Announcements

Everex Tempo Notebook	174
ZEOS 286 Notebook	216
Micro Express Portable	216

TELECOMMUNICATIONS

Prodigy: Where Is It Going? 146

By Adam Gaffin

As the IBM-Sears venture begins its national rollout, it's having a clash of vision with a substantial number of its users. In a related excerpt from *Boardwatch Magazine*, Jack Rickard explains how GENie's benefiting from the situation.

UNIX

UNIX Column 52

By Bennett Falk

Monitoring system activity.

AMIGA

Amiga Column 196

By Matthew Leeds

Hard disk utilities and other new products.

ATARI ST

Atari ST Column 200

By David Hawkins

Long-awaited products debut at COMDEX.



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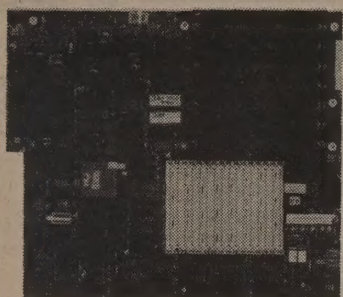
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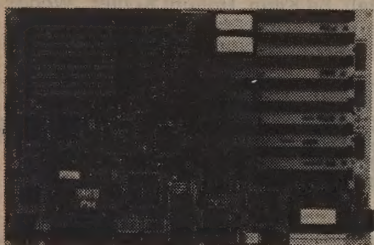
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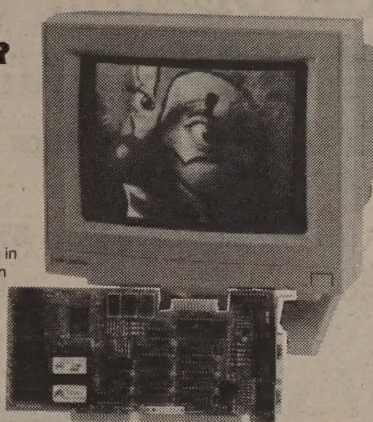
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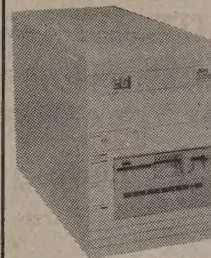
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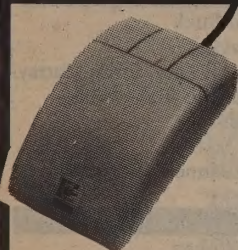
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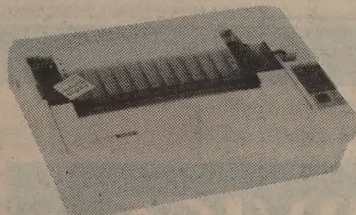


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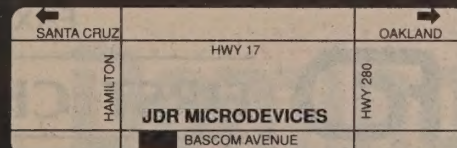
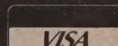
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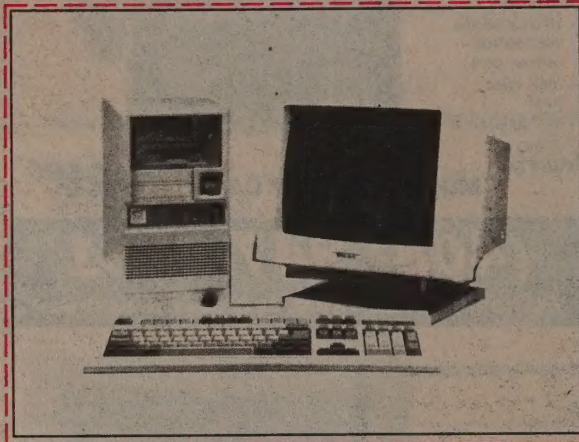
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The Tandy 100 RL: Not Just For The Home Office

I recently received a clip of your August 20 News & Views piece, "New Computers from Sun and Tandy." Thanks for the nice coverage.

I would like to call to your attention, however, that the Tandy 1000 RL is *not* targeted toward the home user who needs a small business computer. We do serve that market as well, but with the Tandy 1000 TL/2 and the 2500 XL computers.

The design philosophy of the RL can be best described by saying we've tried to apply this wonderful new PC technology to the tasks every family has to do around the house. The catch is, these are tasks which do not involve work at home or "office-like" work—things like meal planning, grocery lists, a computerized family bulletin board, maintaining a family appointment calendar, diaries, cataloging collections of video tapes, baseball cards or stamps, creating a savings plan for a child's college education, retirement planning, etc.

The RL is capable of running PC-compatible software, and would certainly serve for an occasional bit of homework, but if a customer said that was the primary objective in buying the computer, I would direct his/her attention toward a TL/2 or 2500 XL.

The RL is really directed at a completely new market, not the "traditional" home market served by

the TL/2, 2500 XL or IBM's new PS/1.

Ed Juge

Director, Market Planning

Radio Shack, A Division of Tandy Corporation

Fort Worth, TX

A Fan Of The Black Box

I must compliment you on your fine issue #75. It's rare to see a mainstream publication such as yours deal so fairly with a "Non-Standard O/S" such as the NeXT. One need only read Wayne A. Yacco's cover story, "A Visit to Chaos Manor," to see how such other "non-standard" operating systems are dealt with. I shudder to think what Jerry Pournelle might have said about the NeXT rather than the Amiga. When a new system is trying to build a user base, positive press is very important.

Gary Brown

(no city listed)

Low-Cost Macs: Too Little Too Late?

Hooray to Apple Computer for finally reducing prices on their exceptional line of computers. At last the famous power and user friendliness of the Macintosh environment is available to all those computer enthusiasts who simply couldn't afford to support Apple's 50% profit margin. The power to be your best, first unveiled in 1984, can now be had by

all.

These are the headlines, but is all this praise deserved? True, the new MacClassic with its \$999 price tag offers a 7.8MHz machine complete with 1Mb RAM and the point-and-click environment that revolutionized the computer industry, but isn't this simply a case of too little too late?

Atari, for example, has offered similar computers to the Mac since 1985, using the same Motorola 68000 processor, running slightly quicker at 8MHz, with 1Mb RAM and a graphics environment utilizing the same mouse-driven ease of use as the Mac. And this has been offered at under \$800 for years. And to top it off, the Atari line has been in spectacular color since its introduction, while the much-touted Mac Classic still comes ill-equipped with the same standard black-and-white monitor it offered in 1984.

The message to Apple's executives should be clear: Wake up to 1985. Yet Apple, a company slow to respond to customer demands and guilty of price gouging, has such a large and loyal following, while Atari is almost unknown by most in this country as a serious computer maker. As consumers we need to support those companies that have supported us by bringing the power of the computer to all people and reject those with false senses of eliteness and inflated price tags.

Michael Riordan

San Francisco

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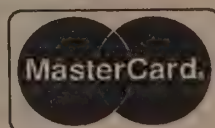
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INDUSTRY INSIGHT

**BY PAUL
HOFFMAN**

YEAR IN REVIEW: THE PC INDUSTRY GETS A DIRECTION (OR THREE)

This time last year I reported that hardware and software vendors were disgusted at the lack of direction in the operating system market for PCs. Of the angry letters I got for that column, most said, "Well, yeah, but 1990 will prove you wrong and there will be massive movement towards a single OS." And they were right to a large extent. Unfortunately for most of the letter writers, they had said that the operating system of choice would be OS/2. I hope they didn't have too much invested in it.

WINDOWS 3 FOR YOU AND ME!

Microsoft surprised most of the PC industry this year by almost abandoning OS/2 in favor of pushing Windows furiously. The Windows roll-out dominated its public relations efforts for most of the year, and it was fabulously successful in getting everyone (even those without PCs) to take Windows seriously. Even Macintosh users had to start getting more defensive than usual about Apple's operating system, a sure sign that Microsoft had penetrated the American psyche with its Windows hype.

Of course, Microsoft will say that it is still all behind OS/2 and LAN Manager. Why, it loves them so much, it lets big powerful IBM take over the development and marketing of them! With supporters like that, you'd better call the ambulance company.

Windows 3 and its accompanying hype hit hard. People upgraded their systems, adding RAM and faster hard disks so that they could try out the much-heralded new system. Microsoft says it shipped well over a million copies of Windows 3, both updates and first-

time purchases, in stores. A few hardware manufacturers started bundling Windows with every system, possibly as proof of how fast and powerful those systems are. Most major software publishers announced Windows products, and many of them delivered.

The result is not clear yet. Most retail stores report slower-than-expected sales of Windows applications, although Windows itself is still selling briskly. As one mail-order company source noted, "Either they're taking a long time to love it or they already have put it in the closet with their old Apple IIs. We're selling one Windows application package for every three or four copies of Windows. And you can bet they're not all happily running Write and Paintbrush."

Most people with 80386SX-based systems were pleasantly surprised that Windows 3 ran all right, especially if they had 2Mb of RAM or more. The few bugs that were reported initially only affected a small portion of users, and the setup program was much better than previous versions of Windows. In fact, most people forgot all about previous versions of Windows.

The pendulum of press opinion swung quickly this year. Up to the release date, there were many people predicting that Windows would be fine for power users but would be of little value to the rest of us. The second it was released, almost everyone immediately ran to the "God, isn't it a great program" school of writing. Within about two months, many had swung back, feeling a bit freer to talk about the obvious problems and to muse about the lack of software. By the end of the year, the new major software titles were coming out strong, and the press went back to singing the praises of Windows since, after all, software makes an operating system. Windows made it to most magazines' "best software of the

**Windows 3
and its
accompanying
hype hit hard.
People
upgraded their
systems,
adding RAM
and faster hard
disks so that
they could try
out the much-
heralded new
system.**



Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman@well) and MCI Mail (264-3171). He also writes popular microcomputer books.

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- 2 SERIAL, 1 PARALLEL, 1 GAME PORT
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- SOCKET 80387 & AMI BIOS
- 1X32 BIT, 5X16 BIT, 2X8 BIT SLOTS
- REAL TIME CLOCK W/BATTERY BACKUP
- 1.2 FLOPPY DRIVE
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- 2 SERIAL, 1 PARALLEL, 1 GAME PORT
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LANDMARK=33

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- SOCKET 80387 & AMI BIOS
- 1X32 BIT, 5X16, 2X8 BIT SLOTS
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- 1.2 FLOPPY DRIVE
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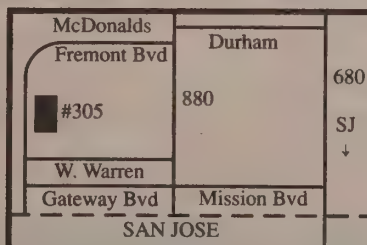
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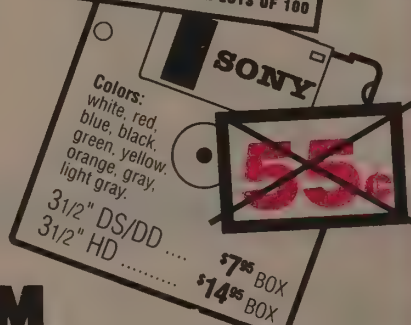
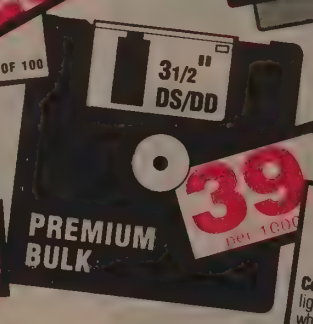
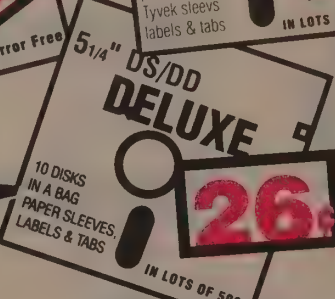
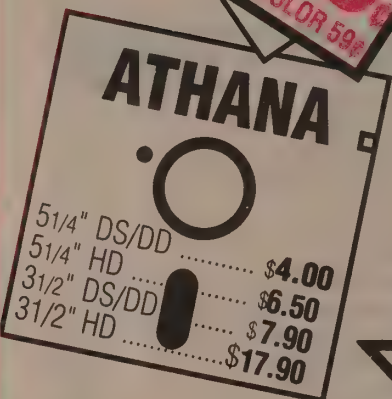
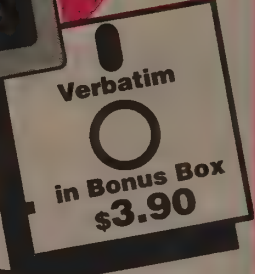
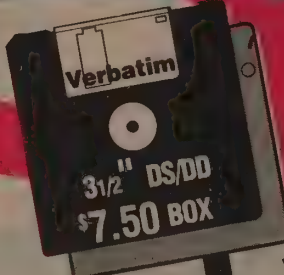
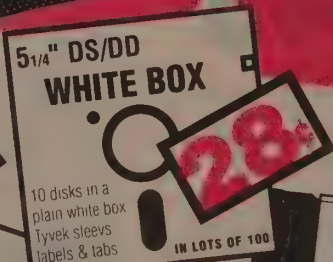
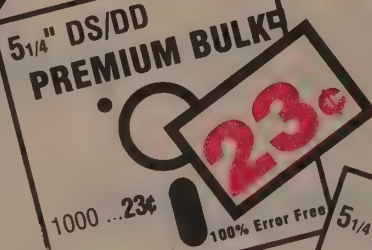
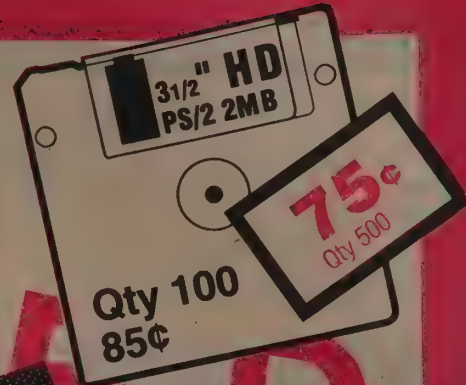
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year" lists and all was forgiven.

Or was it? Software manufacturers are already very worried about Microsoft's many differing plans for allowing Windows software to run under OS/2. No one is even pretending any more that it will be easy to port Windows applications to OS/2 (look how long it has taken Microsoft to adapt Word for Windows to OS/2, even though it was written with that in mind). Companies are worried that they will have to jump through even more hoops to make their software compatible with OS/2, and that Microsoft can no longer be trusted when it says how something will happen a year from now. Users are also afraid, as can be seen by the few who are buying new Windows applications. They shouldn't be afraid of whether the Windows standard will take hold: it already has.

THE WONDERFUL WACKY WORLD OF HARDWARE

Another significant contrast to 1989 was the forward movement in hardware in 1990. PC clone buyers started earnestly buying towards the higher end of the scale, eschewing the 80286 for the 80386SX and better. They did this in such numbers that Intel ran short of 80386 chips in the early part of the year and hasn't fully recovered. This has helped segregate the major manufacturers, whose supplies were assured, from the smaller mom-and-pop assemblers who had to buy in the pricey secondary market. The prices of clones continued to drop steadily throughout the year, but you could see the beginnings of strain on the low end by fall, and the recession won't help the small stores at all.

Clone makers had other competition from both Apple and workstation manufacturers. Apple released a slew of new high-end and low-end Macintoshes at the beginning of the year and near the end. It finally shed its image of "quality, but price be damned," although it is still much easier to buy an entry-level clone than it is an entry-level Mac (it just won't do as much). The IIfx, the fast system introduced at the beginning of the year, gave Apple a strong presence at the very high end of the PC scale.

Coming down from above, many workstation manufacturers, notably Sun and Silicon Graphics, introduced low-end workstations that will probably challenge 80486 systems in the engi-

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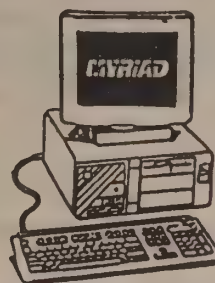
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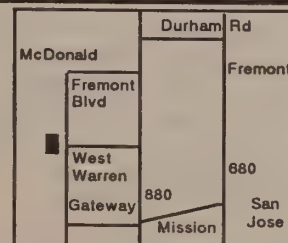
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VIDEORAM FOR VIDEO CARDS	Price
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64X4-100 NS 412642-10	5 ⁰⁰
CACHE MEMORY 16X4	
HM 6788-25	\$6 ⁵⁰
MC 6288-35	9 ⁵⁰
64X4 CACHE MEMORY HM6708P25	24 ⁰⁰

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80387SX-20	310 ⁰⁰
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80387DX-20	340 ⁰⁰
80387DX-25	425 ⁰⁰
80387DX-33	525 ⁰⁰
80C282-10 AMD	120 ⁰⁰
80C712	135 ⁰⁰
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3167-20 20MHz	\$300 ⁰⁰
3167-25 25MHz	350 ⁰⁰
3167-33 33MHz	500 ⁰⁰
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1MX9 80NS S/C	70 ⁰⁰
1MX9 70NS S/C	75 ⁰⁰
1MX9 60NS S/C	75 ⁰⁰
4MX8 80NS	255 ⁰⁰
4MX9 80NS	250 ⁰⁰
4MX9 70NS	275 ⁰⁰

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1 MGX1-80NS	5 ⁰⁰
1 MGX1-70NS	5 ²⁵
1 MGX1-60NS	6 ²⁵
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256X1-150NS	\$1 ⁷⁹
256X1-120NS	1 ⁹⁹
256X1-100NS	2 ⁰⁰
256X1-80NS	2 ²⁵
256X1-70NS	2 ²⁵
256X1-60NS	3 ⁹⁹
DRAM 256X4	
256X4-120NS	\$4 ⁵⁰
256X4-100NS	4 ⁷⁵
256X4-80NS	4 ⁹⁹
256X4-70NS	5 ⁰⁰
256X4-60NS	8 ⁰⁰
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4164-15	\$1 ⁵⁰
4164-12	1 ⁹⁹
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4464-100	2 ⁷⁵
4464-80	3 ⁰⁰
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NEWS & VIEWS

neering and graphic design markets.

NeXT's new system was announced in the fall and should be shipping in quantity by the time you read this. Based on the Motorola 68040, the NeXTStation could prove a challenge to Apple if NeXT can sell more than a few tens of thousands of them. For the price of a mid-to-high-end Macintosh, NeXT offers a screaming computer running UNIX on a beautiful display. At the same time, you get a digital

signal processor (DSP), a flexible and incredibly fast support chip that helps the box turn into a music processor, a FAX machine, a modem, and many things that we're sure to hear about in the next few years.

While everyone was trying to make waves on the high end, IBM got its biggest publicity of the year by introducing the PS/1, a crippled home computer that will be sold by department stores across the country. Not to be put off by its miserable failure with the PCjr, IBM feels that it will be successful with a machine that has pretty much the same configuration as a low-end clone for 40% more money. The bundled software should help, the ease of assembly should help, but the serious lack of a real home market could topple this system as easily as it has toppled many other attempts at the elusive home office market.

LAWYERS: YOU CAN'T LIVE WITH THEM...

1990 saw one of the first major copyright cases taken to conclusion when Lotus won a decisive victory over Paperback Software. The judge in the case said that Paperback had unequivocally infringed on Lotus's copyright by making software that had very similar screens and took very similar commands to operate. The ruling was hotly debated in the press and by programmers who now have to wonder how much can something look like

something else before it becomes a legal liability.

Lotus, never one to let its legal staff sit down, turned around and immediately sued Borland and Santa Cruz Operation for what it said were infringements similar to Paperback's. The case against Santa Cruz Operation was clearly similar to Paperback Software, but the Borland case is much more difficult, since there are many interfaces available for Quattro. In addition, the Quattro screen looks much less like 1-2-3 than Paperback's did, making the case even more tenuous. Of course, Quattro was starting to eat into 1-2-3's sales at the time of the suit, so Lotus's decision to litigate looked even more like a marketing ploy.

Hitachi and Motorola settled their lawsuit late this year, many months after ignoring a judge who told them that it was a silly suit. The judge repeatedly criticized both sides for not settling out of court in a businesslike fashion and did everything he could to get the companies to agree. When they couldn't, he ordered both com-

PC clone buyers started earnestly buying towards the higher end of the scale, eschewing the 80286 for the 80386SX and better. They did this in such numbers that Intel ran short of 80386 chips in the early part of the year and hasn't fully recovered.

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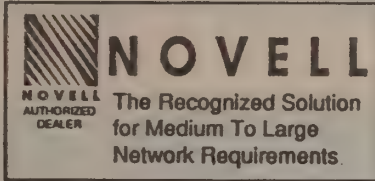


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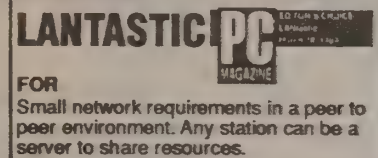
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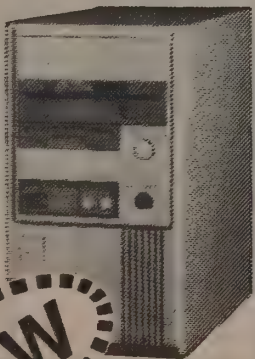
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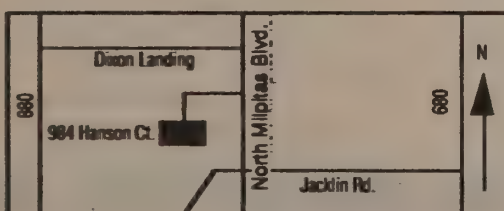
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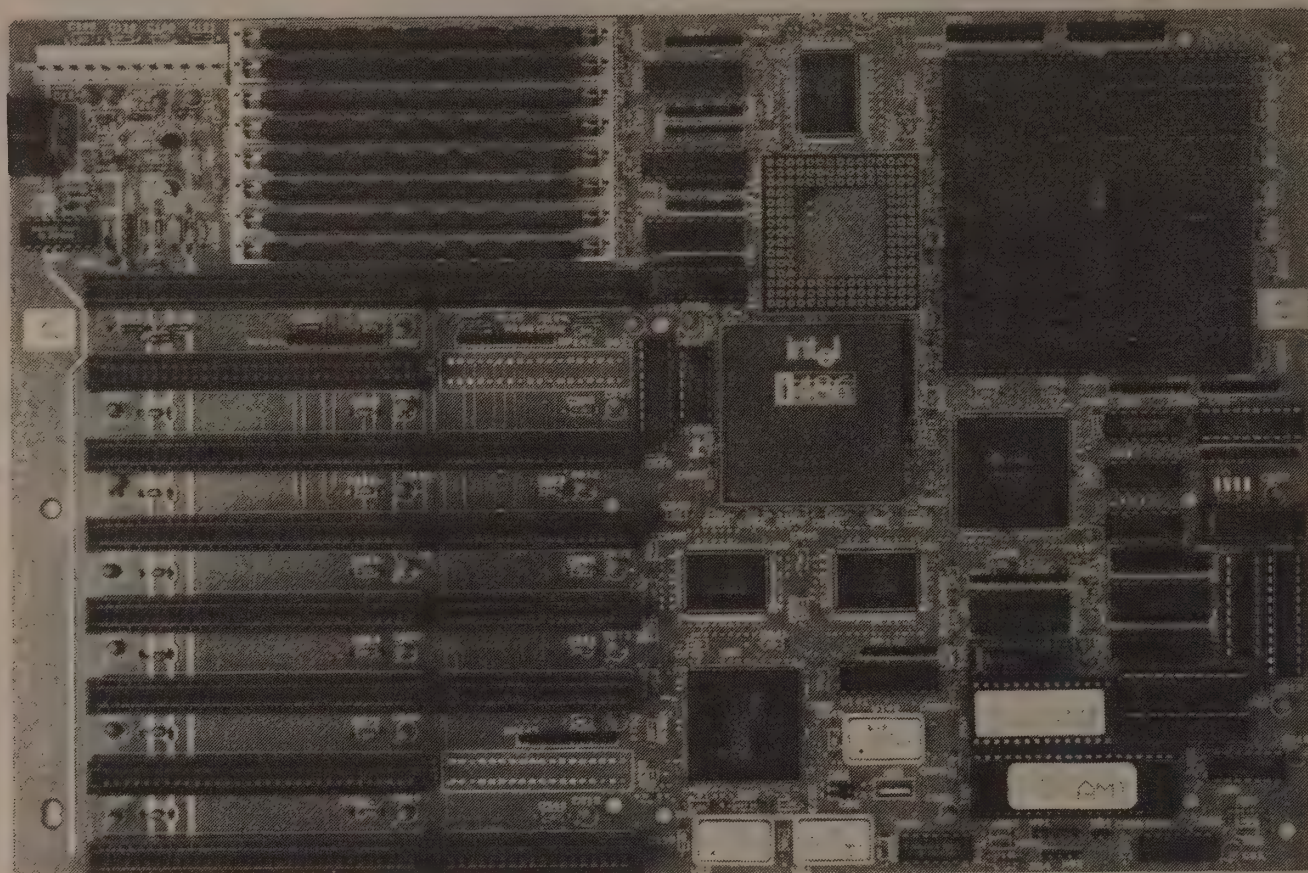
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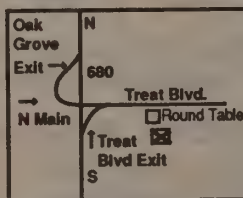
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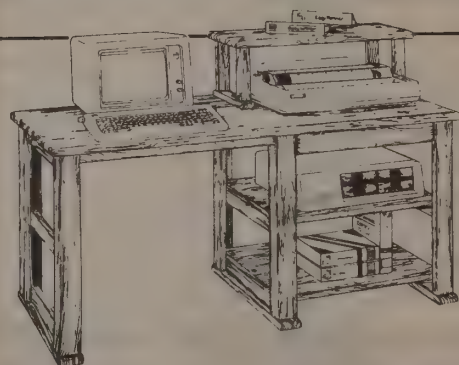
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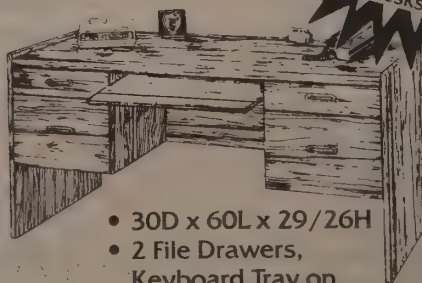
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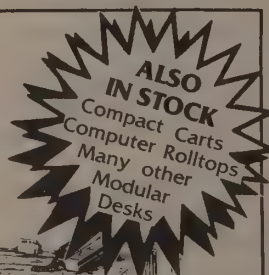
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panies to stop making the offending chips in order to force their hands. Instead, they went around him so that they could both manufacture their chips and continue to sue each other. When they finally settled late this year, they kept the terms secret.

The arbitrator in the Intel vs. AMD suit decided that Intel had done everything it could to invalidate the agreement and had shown as much bad faith as a company could. Intel declared the ruling a victory because the arbitrator didn't award AMD any damages yet. For its part, AMD began showing a clone 80386 based on the Intel design that ran almost flawlessly and might be available within a few months. The new chip will be cheaper, faster, and better in portables than Intel's, but there are always other courts that Intel can go to to stop them.

Ain't life grand?

1991: WHEN TITANS FALL?

No one has ever accused high tech of being

Continued on page 231

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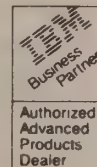
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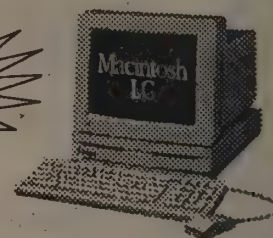
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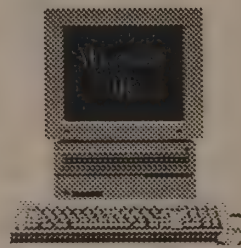
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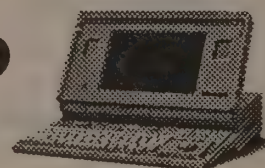
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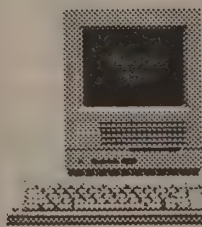
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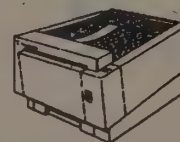
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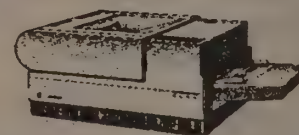
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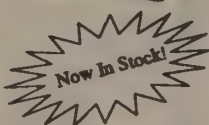
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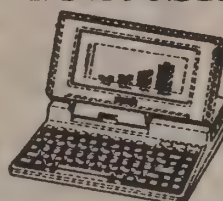
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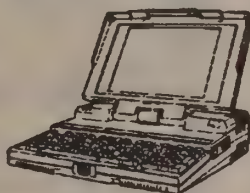
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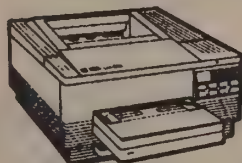


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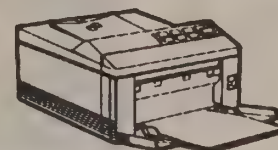
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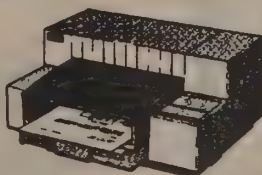
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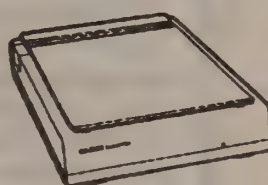


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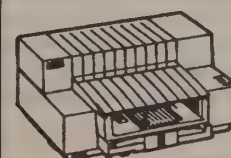
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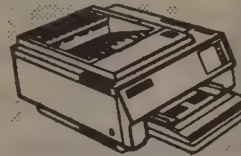


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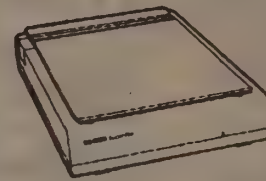
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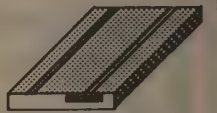
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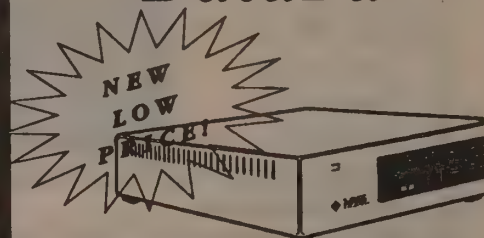
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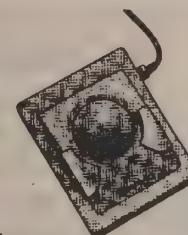
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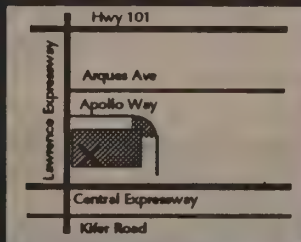
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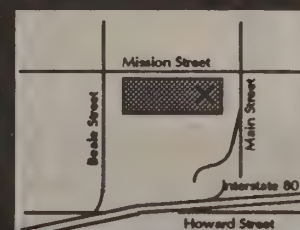
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Who's Listening To Your Cellular Phone?

Plus: Dandy Doodling, Friendly Fax & Protecting Future Fantasies

BY JIM WARREN

This column concerns that which isn't—but can be, as soon as we do it. No scientific breakthroughs required; just hard work.

ELECTRONIC TRACING PAPER

Drawing and drafting programs should have "tracing paper" options. A user should be able to electronically overlay one drawing file on another, with the drawing on the "bottom" being visible "through" the drawing on the top—in lighter gray or user-chosen color. By point 'n' click, the user should

maintained a Patent Court.

Comparable problems exist relative to (allegedly) proprietary software—even more so as long as courts continue to tolerate "look and feel" lunacy (approximately equivalent to the serious investigations in the Dark Ages of how many angels could dance on the head of a pin).

Thus, we need a Software Court. And we need it *now*—before technically naive judges, scattered around the nation, create a patchwork nightmare of inconsistent, irrational, myopic case-law that leaves even the most honorable of software entrepreneurs

nervously awaiting the knock of the litigator's knuckles.

(This idea evolved

from a Hackers Conference luncheon conversation with Susan Nycum, one of Silicon Valley's best-known high-tech attorneys and *honcha* of Baker & McKenzie in Palo Alto.)

REALIZABLE FANTASIES

be able to copy drawing components from the "bottom" drawing into the "top" drawing file. (Implementation is definitely nontrivial.)

FAX FANTASIES

Fax machines should accept the original sheets for transmission, face-up. That allows the user to read the phone number that is almost always scribbled on the cover sheet.

Let's have fax machines more vertically oriented. They would take less space on a desk and use gravity to help feed originals on a steep input ramp. Having their information-display on a 45-60° slope would make it easy to read sitting or standing. (The Minolta 261 does most of this, but has a user interface not even a UNIX hacker could love, and demands an infuriating 1-2 second delay between each key-press.)

And, if they could make that sleazy paper not curl and stack it in reading sequence...

A SOFTWARE COURT

Protecting proprietary software doesn't fit comfortably under traditional copyright protection, nor under patent protection.

Patents are often highly technical, and litigation about them is often technically complex. Recognizing the need for astute judges, competent to handle technically complex patent litigation—and handle it in a non-provincial manner—the judiciary has long

PROTECTING ELECTRONIC PRIVACY

There is a simple solution to the increasing—and justified—concern over snooping and surveillance on electronic mail and private teleconferences: Encrypt everything—and I mean *everything*! This means that mailer programs and teleconferencing software need to implement easy encryption and decryption facilities—sort of electronic envelope openers.

Encryption is somewhat the digital counterpart of an envelope. Unencrypted email is like a post card. It can provide entertainment for idle sysops and nosy administrators along its entire transmission path, just as post cards have done for generations of postal workers. It can also provide invaluable information for corporate and national competitors.

"Encrypt-all" can assure protection, even using the federally adopted DES (Data Encryption Standard)—intentionally brain-damaged by the National Security Agency to assure that documents would be "crackable." The NSA allegedly wanted to be able to read anyone's email the NSA wanted to read. Given hours or a few days on a super-computer, the NSA can crack documents en-

Given the amount of eavesdropping that's going on, I've always wondered why wireless and cellular phones don't yet have scrambling or encryption options.

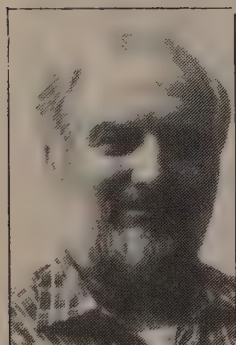
crypted with the DES' 56-bit keys; not possible if they had permitted 64-bit keys. Of course, so can *any* corporation or government with super-computer access.

But, what if *everything* is encrypted—from "Hi, ma. Wish you were here," to essential organizational and national secrets? Then, corporate and government spies run out of super-computer power, since they can't identify "interesting" messages without decrypting them. (*Blegh!* Next, they'll be replacing the "missile gap" with the "computer gap." At least it's less likely to cause home and family to glow in the dark.)

There remains the problem of how to give recipients the keys to decrypt documents sent to them, but there are a variety of solutions to that—from separate transmissions by different channels, to "book codes" to public-key ("trap door") algorithms.

Note: This proposal applies equally to digitized voice—and picture—communications, limited only by the ability to digitize, encrypt and decrypt in real time. Given the amount of eavesdropping that's going on, I've always wondered why wireless and cellular phones don't yet have scrambling or encryption options.

(Most of these ideas evolved from conversations with John Nagle and Autodesk



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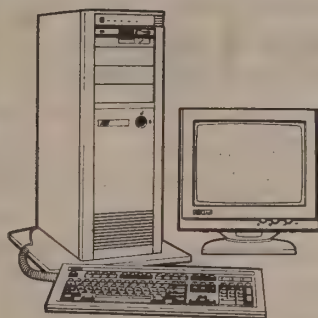
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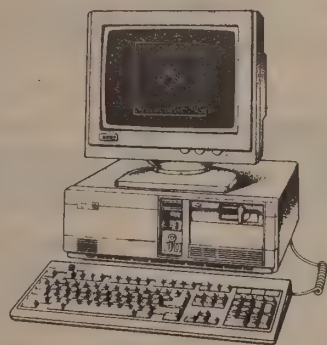
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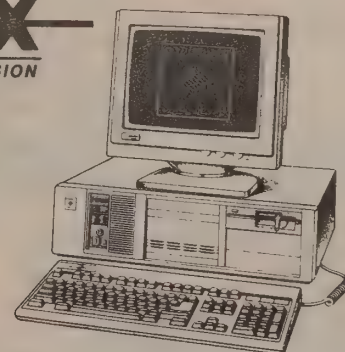
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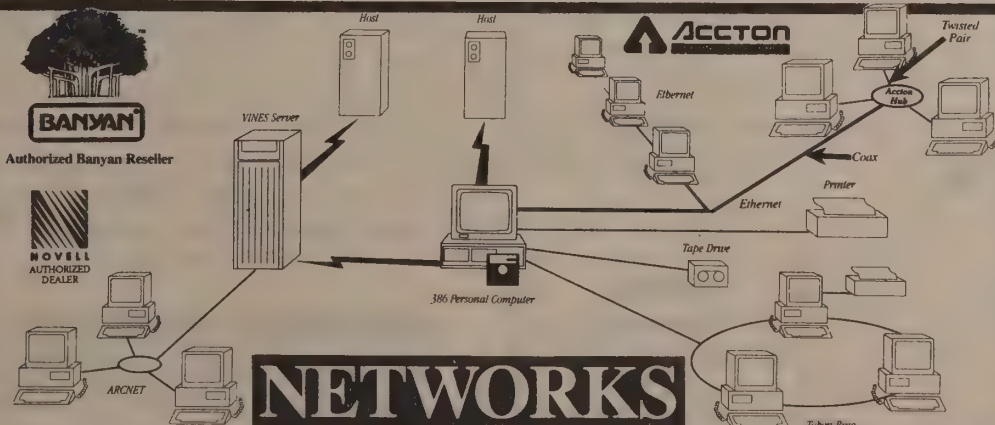
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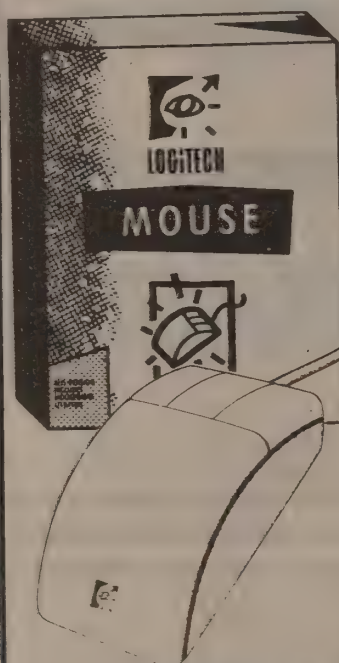
THIS IS SECURITY?

The DES encryption and decryption algorithms are public knowledge. Source code implementing them has long been distributed as part of the US version of UNIX System V source-code packages—thus being accessible to anyone with access to those sources. Literally thousands of such systems

serve as host computers connected to dozens of international networks; most keep the system source code on-line.

But government regulations have prohibited distributing DES source code outside the US. This surely keeps foreigners from downloading DES sources from any of the multitude of systems to which they have legitimate access. Yeah, it does! What it *also* does is suppress individuals and organizations from using the nationally adopted standard for secur-

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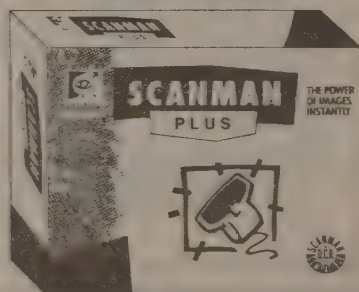
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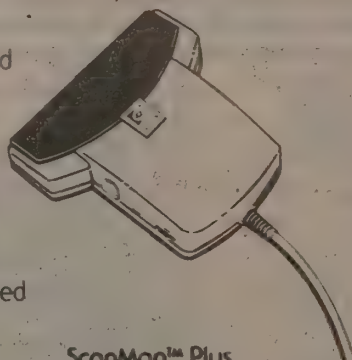
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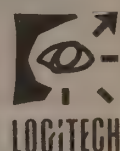
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Copiers and sheet-feed printers should have lift-top paper holders; not those jerk 'n' curse spring-clamped removable paper trays. Opening the top could release the clamping pressure on the paper.

I had this queued up as a fantasy, but found that it's already scheduled for delivery: Us couch potatoes want a module that will convert yucky-standard NTSC television signals into pristine Super-video—for S-video TVs and S-VHS recorders. Lowell Noble of SOCS Research in Los Gatos said he has the prototype running, and plans \$300 units for 2Q'91 delivery. They not only do the conversion; they also remove distracting artifacts and enhance edges. *Neat!*

CONCEPTUAL SHAREWARE

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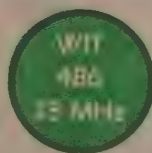
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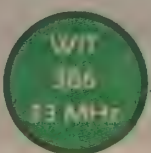
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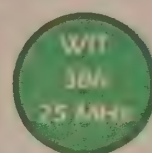
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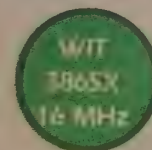
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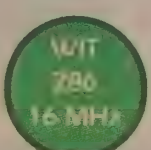
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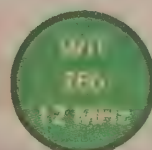
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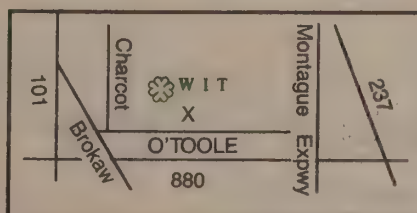
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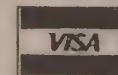
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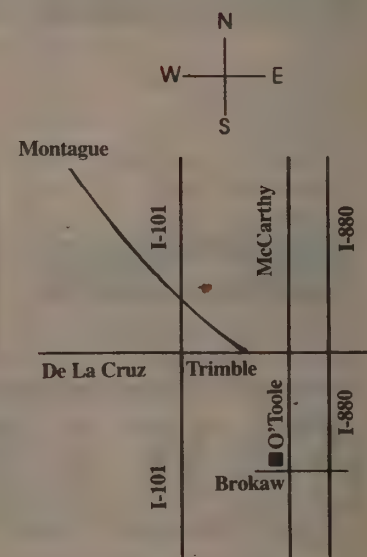
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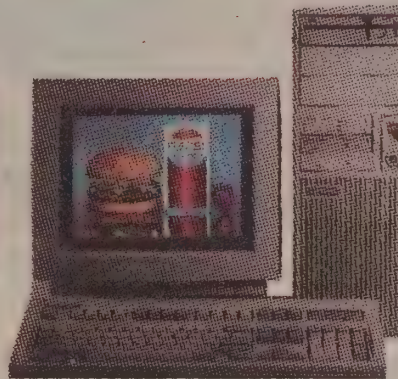


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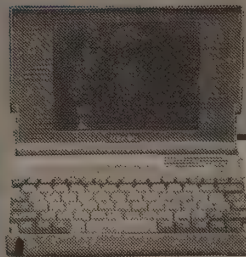
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- Nicad battery pack (approximately 2 hours per charge)
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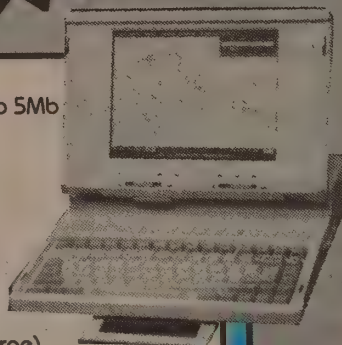


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- High contrast paper white video display
- 20Mb Hard Disk Drive (optional 40Mb HDD available)
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Slotless Expansion

Creating Full-Featured Portable-Based Systems

BY ED
KAHN

More and more, computers are becoming modular devices. At the same time, laptops are becoming increasingly powerful. These two forces are working together to produce a whole new crop of peripherals designed to make up for elements that laptops don't have, and thereby create full-featured systems.

As portables—especially the smaller ones—become more powerful, they can really compete with desktop computers. These days you can often buy a portable as your only machine. But if you need more than memory and raw computing power, you may still decide on a desktop. For one thing, a desktop machine is certainly lots less expensive. And, until recently, expandability was really only available on desktops. After all, expansion slots are not common on small laptop and notebook computers.

But things are beginning to change. In the last few months I've assembled a collection of accessories that connect to small portables through the parallel port. This means that you can, in effect, expand these slotless portables through the parallel port. Of course, this doesn't offer the full flexibility of slots; there are fewer options available. And when you attach these devices, they severely limit the portability of the machine; they're really designed for use when you're *not* on the road. The idea seems to be that you can build up a system in a primary location, then strip the machine back down when you really need portability.

Some of the devices feature a piggyback plug so you can still use the printer from the parallel port.

connects through the parallel port and provides expansion slots that will take standard XT and AT expansion cards. The device also has room for additional disk drives. Most models have their own power supply, so you will be limited to using these expansion capabilities when you're in a fixed location.

But that's the idea. When you're in the office, you have access to the same kind of setup you would expect from a large desktop system. You can install network cards, modems, faxes, hard drive controller cards, scanners, additional parallel or serial ports and anything else you can imagine. You can also install disk drives, as each model has room for several drives in addition to the slots themselves. The largest model has eight expansion slots and four open bays for disk or tape drives. The smallest model contains one expansion slot. The prices vary from model to

model, ranging from \$295 to \$795.

AXONIX DRIVES

Another product that connects through the parallel port is a hard drive. Axonix Corporation makes a whole line of hard drives ranging from 20Mb (\$799) to 200Mb (\$2,299). These drives are especially useful for people using laptops without hard disks (or with hard disks that are too small). The drives are also useful for executives who want to carry their data with them and connect to a local portable—or desktop—once they get to their destination.

The portability of the drive is a major asset, for it allows all kinds of flexibility. The manufacturers of these drives clearly made them for laptop users frustrated by the limitations of their portables. Although these

In the last few months I've assembled a collection of accessories that connect to small portables through the parallel port. You can, in effect, expand these slotless portables through the parallel port.

EX-PORT

The most widely applicable device is the Ex-Port from Lightek, which comes in different sizes and has different capacities. This device

drives do require a power supply, an optional battery pack is available. The company, by the way, makes a wide range of expansion products for portables. Get in touch for a catalog of expansion possibilities ranging from floppy drives to expansion chassis.

BACKPACK

Another parallel expansion product is the Backpack line of floppy disk drives. They give

you the ability to expand a one-drive portable into a two-drive machine. The drive connects through the parallel port and comes in four models. There are both 3.5" and 5.25" drives selling for \$349.

However, the most interesting offering is a 2.8Mb drive (\$425). This 3.5" drive works perfectly for carrying around large amounts of data if you don't have a hard drive portable, or for backing up. With these huge disks, backups are reasonably easy. A num-

ber of high capacity drives are now in development. This one seems to be a winner. Even though the disks cost about \$10 each, you'll find it very cost-effective for backing up a 40Mb disk. It is rumored that IBM is considering endorsing and using these quad density disks and drives.

The product is well thought-out—you can daisy chain these drives and still plug a printer into the last drive in your chain. Formatting software comes with the drive. You can also move this drive from computer to computer.

VALITEK TAPE DRIVES

A final product is a portable tape drive to be used for backup. Valitek makes several different models, ranging from a 60Mb system (\$1,695) to a 250Mb system (\$2,295). While this sounds like a lot of money, if you're backing up a number of computers, the cost per unit tumbles. No card is necessary, in contrast to the less expensive tape backup systems on the market. Software comes with the units.

This may be the cheapest way for a corporation to back up. I've heard of one enterprising businessman who's bought one of these systems and travels from office to office on a weekly basis to do backups for businesses that use his service. While tape backups that connect to a parallel port are a great idea for portables, they work equally well with desktop units. ■

RESOURCES:

Axonix Corp. 1214 Wilmington Ave. Salt Lake City, UT 84106 (800)866-9797	(216)673-5358
Backpack MicroSolutions 132 W. Lincoln Way DeKalb, IL 60115 (815)756-3411	OmniKey Ultra Keyboard \$149 Northgate Computer System 7075 Flying Cloud Dr. Eden Prairie, MN 55344 (800)526-2446
The Brick \$2,495 Ergo Computing One Intercontinental Way Peabody, MA 01960 (800)633-1925	\$239.95 Datadesk 9314 Eton Ave. Chatsworth, CA 91311 (818)998-4200
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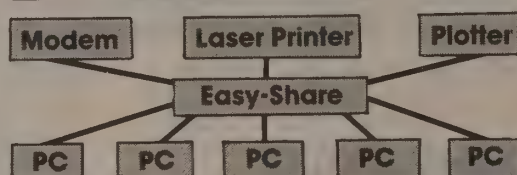
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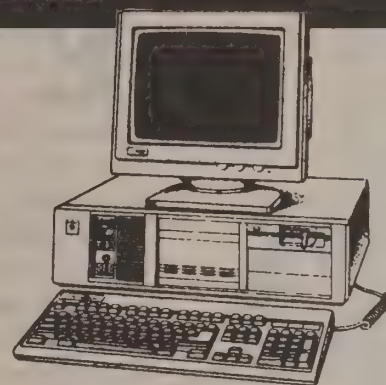
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Computer Of The Month: The Brick

Ergo Computing has come out with the most interesting portable I've seen in a long while. Although this box is not for everyone, it's a great machine for those whose needs match its features.

The Brick is about the size of a couple of reams of paper, measuring 3.3" x 8" x 11.3" and weighing 8.3 lbs. It has no built-in monitor, no built-in keyboard and no rechargeable batteries—it's not designed for the general portable buyer. It's essentially a box, with nothing more than the computer itself with all of its ports.

This machine was designed for the person who works between a couple of locations and has the money to provide stationary power supplies, keyboards and monitors at each location. The computer and its hard disk travel back and forth. This computer is really designed to take the place of a desktop machine.

The unit I evaluated came with a full color monitor and full size keyboard. You can beef this system up as much as you want, with hard disks from 40-200Mb and RAM all the way up to 8Mb with the addition of memory modules.

The basic unit comes with a 2400 baud Hayes compatible modem as standard fare. Ergo included the modem, among other reasons, because it does diagnostic work on misbehaving machines by using the modem and running tests from the plant in Massachusetts. It also downloads software to its customers via modem.

The machine also has a couple of half-length slots that will accommodate XT and AT compatible cards. One of these is usually used for the included 3.5" drive, but if you prefer you can order the Brick without the drive to provide a second slot.

The Brick will support Extended VGA graphics. In addition, it will accommodate almost any monitor you want to use. On the back there is both a VGA port and a nine pin connector for other video standards. In addition, Ergo includes two serial and one parallel port, and provides for the use of a docking station, which will hold standard expansion slots and make quick connection and disconnection of the portable Brick easier. Just when this accessory will be available is not clear, however.

Ergo customizes each unit it ships. Sales are direct from the factory, so they can set the machine

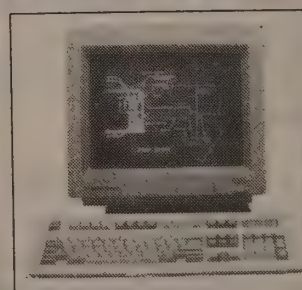
This machine was designed for the person who works between a couple of locations and has the money to provide stationary power supplies, keyboards and monitors at each location. The computer and its hard disk travel back and forth.

up just the way you want. They will even install software, ranging from DOS to DESQview. The keyboard that comes with the unit is a lot better than any laptop offers, but I would still prefer to get either a Northgate OmniKey Ultra (\$149) or a DataDesk Switchboard (\$239) as they are my current favorites.

If you are among the 85% of portable users who use the machines primarily in two locations, then consider the Brick. It is a powerful unit that can compete with many desktop units.

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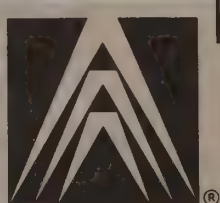
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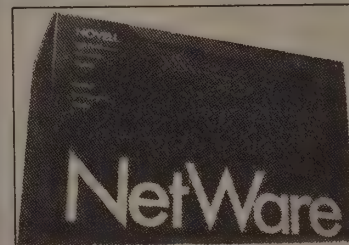
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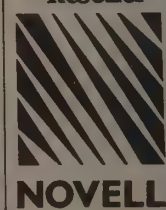
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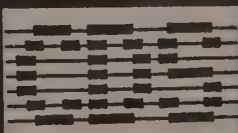
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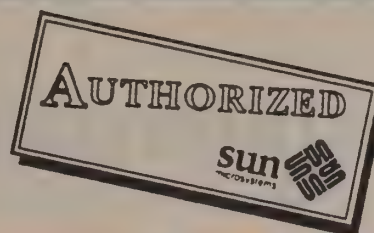
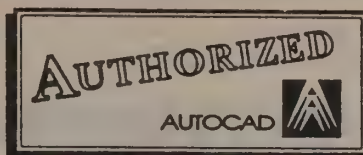
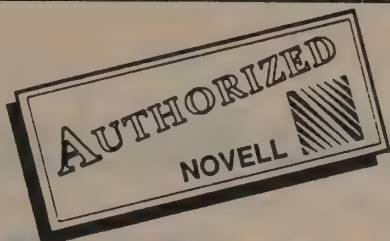
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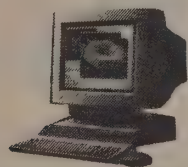


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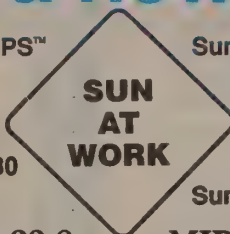
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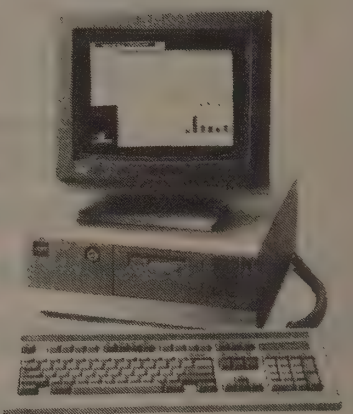
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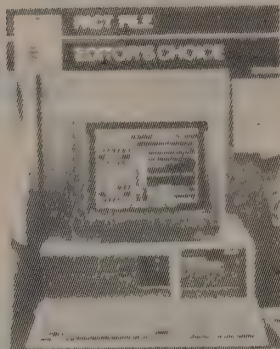
The Bravo 486/25 is a full-power i486 computer at a remarkably low price. With a 25MHz, i486 microprocessor, integrated 8Kb of cache memory and an 80387-compatible math coprocessor, the Bravo 486/25 is, to put it quite simply, a screamer. Nearly two times faster than a 33 MHz 386 system, it's even faster than a Sun SPARCstation™.

AST's no frills Bravo 486-25 performs well — December 10, 1990 **PC WEEK**



AST Premium® 386SX/16

PC
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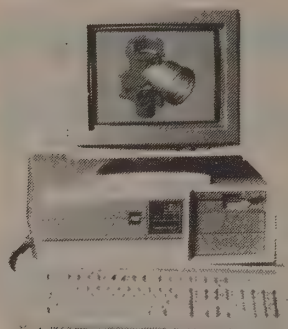
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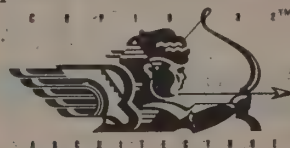
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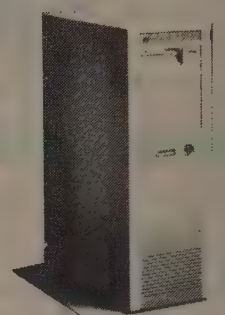


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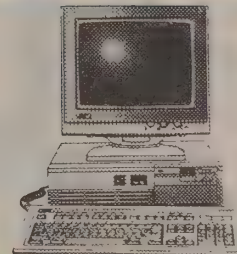


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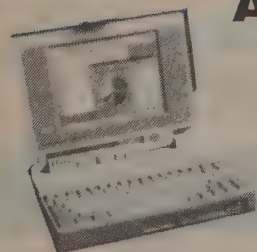
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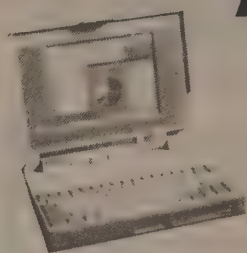
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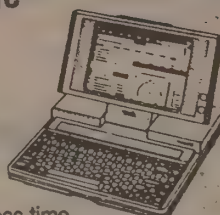


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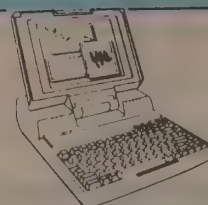
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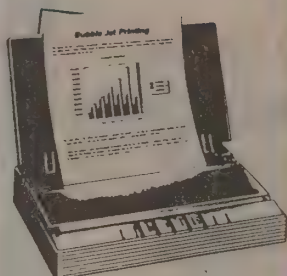


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Mapping Your Network With Macintosh

Network And Resource Manager

BY WAYNE
A. YACCO

The landmarks of your empire—a large installation of computers and networks—are displayed before you on the color monitor of your Macintosh. Your responsibility for the hundreds of computers and peripherals spread across dozens of buildings might seem all but unmanageable to an observer.

Just now, the building where you've got a network down is off the edge of the screen and out of sight. You could zoom out with a click, but you already know your way around and grab the map instead. It responds to your mouse with rapid movement. Spotting your target, you click on it, and the map is replaced with the building's precisely

did.

If there's nothing like it, the vendor can still try to find a way to describe it that's catchy. Jan Lewis has praised Borland for doing this for Sidekick, which essentially required the creation of the desktop-accessory market position. But not all complicated applications will lend themselves to a catch phrase or simple concept. In such a case, the vendor must devise another strategy.

Aperture Visual Information Manager, from Aperture Technologies, had a position: facilities management. However, it was still difficult to explain in a dramatic way how the complex product provided a solution that justified its pricey position. Aperture's solution turned out to be Network and Resource Manager—an example that showed off the facilities-management program's features in a practical application.

Network and Resource Manager is a fully formed application. It should be; it was developed as a custom application for one of Aperture Technology's clients. That client wanted to use the company's software, but didn't want to install the internal resources necessary for development.

As a result, this application is now available for off-the-shelf management of networks. Well, perhaps not quite off-the-shelf. It still requires a serious commitment to create and/or organize the maps, floor plans, furnishings, equipment, and database that describe all the facilities that require management. However, the program tremendously reduces the effort, and when you've finished, provides you with very powerful tools for data analysis, report prepa-

LOCAL AREA NETWORKS

scaled floor plan. You've already identified the source of the problem. It's in the order-entry department. You click on that office and it fills the screen. All the desks, computers, and wiring are clearly visible.

The troublesome computer now sits before you, positively identified by its serial number. You pop open its associated records in the database and extract its date of service, warranty terms, service provider, several phone numbers, and the user's name. The user name looks familiar, so you bring up a photo to refresh your memory. In a few minutes you've dispatched someone to service the machine.

Next you perform a search for a replacement, a Mac IIci or better with at least 5Mb system memory and 40Mb of free hard-disk space. One that's not currently in use is located nearby. You advise the user and take the opportunity to solidify your base of political support.

With that brush fire out of the way, you get back to producing the custom report your VP just demanded. Within a few minutes you've produced a formatted list of all Macintosh computers, their installed software, hard-disk capacity, and system memory. You'll probably be able to get the additional memory your users need sooner than you expected.

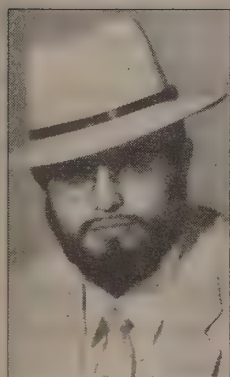
One piece of software made it all possible. The funny thing is that it was developed almost as an afterthought.

GENESIS

All new applications have a common hurdle to overcome. In order to enter the marketplace, they have to establish a position for themselves that defines their functionality and establishes their value. A successful market position requires a recognizable category.

That may be an easy requirement to satisfy if the position fills an existing application area, like general-ledger accounting did. Or if it supplies an analog to a manual application, like page-layout software

You've already identified the source of the problem. It's in the order-entry department. You click on that office and it fills the screen. All the desks, computers, and wiring are clearly visible.



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BUSINESS SOLUTIONS

ration and hands-on resource management. Available controls include the use of drawing layers that can be switched on or off individually to vary the level of detail presented for different applications.

HOW IT WORKS

Visual Information Manager is the base application. It's essentially an integrated CAD package and database. Each part is

limited to what you need for the job, but neither part stints in giving you plenty of control where you do need it. In addition to productive drafting tools, there are import facilities—for PICT images, AutoCAD drawings (with symbols), and data files—and very easy-to-use tools for linking everything together. Furthermore, you can copy equipment images with their associated record structures. Even selected data can be copied

with them.

N&RM adds the DXF conversion utilities (a VIM option); symbol libraries that let you add desks, computers, and other equipment without drawing them; an example project; and three well-done video tapes that provide an overview and tutorials for N&RM and VIM.

AS LONG AS WE'RE TALKING ABOUT THE MAC...

Recently I had my first opportunity to modem an article to a publication using the Mac. While my MicroPhone II telecommunications software did a nice job of living up to Apple's ease-of-use credo, I noticed that, when it comes to connecting a modem, the Mac seems to offer no advantages over the PC whatsoever. You get the same type of assorted cables, connectors, and genders, and are left to figure it all out for yourself.

I was using Xecom's neat little pocket fax/data modem, but it didn't help. In the near future, Xecom will ship this battery operated mode with full bidirectional 9600-bps fax and 2400-bps/MNP5 support for both the Mac and PC. However, the fax software wasn't ready, and only a PC version was shipping. So, for now, I had to use a printer cable, a null-modem cable, and a gender changer to connect it. If it didn't work the first time, several experiments might be required.

I was lucky, but I have found a simple, inexpensive way to eliminate the guesswork altogether. IQ Technologies' Smart Cable comes in three flavors: Mac, AT, or Universal. Depending on the model, there are one or two switches and some lights on one end of the cable. You set the switches according to simple rules governed by which lights come on when the cable is connected. That's it. ■



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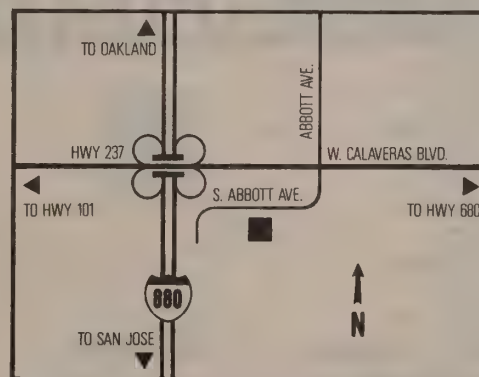
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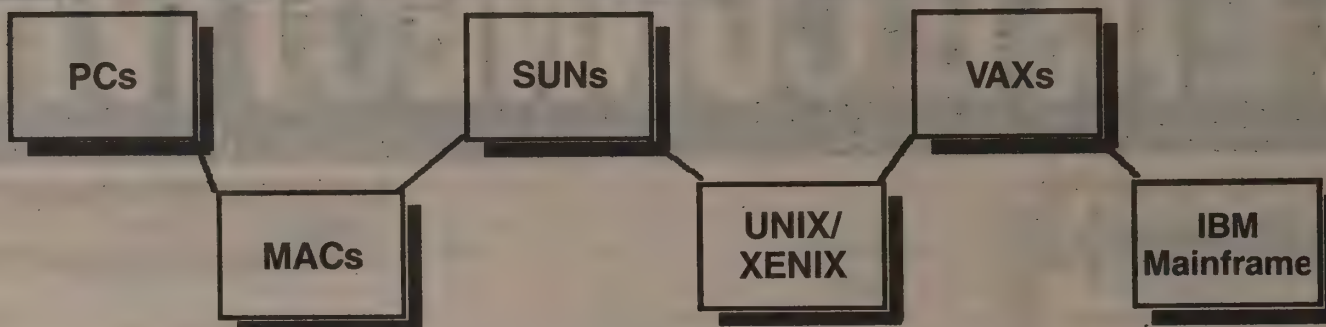


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INTO COMPUTERS

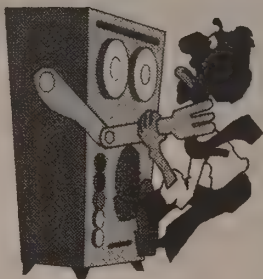
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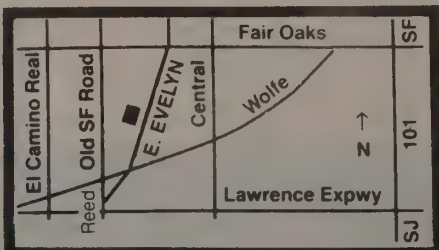
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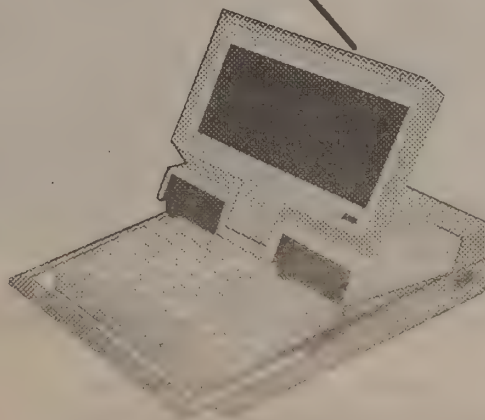
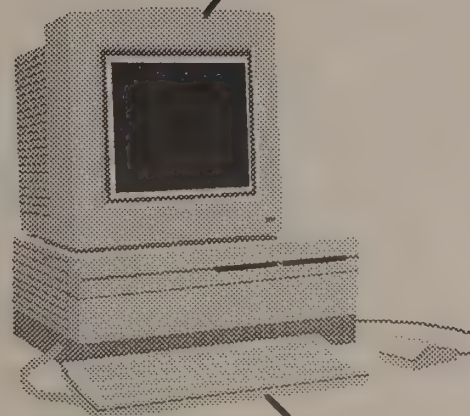
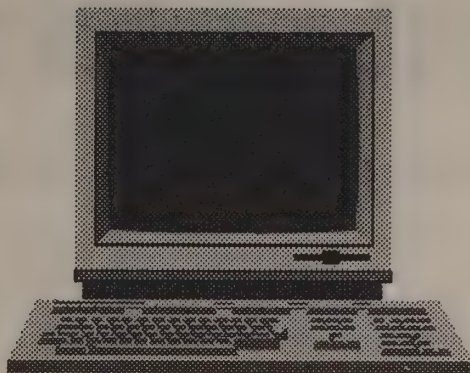
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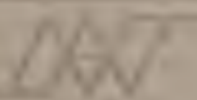
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What's Happening On Your System

Or The Unexamined Life Is Not Worth Living

BY BENNETT
FALK

It's really not particularly difficult to monitor what goes on on a single-tasking computer. The performance of the system is always the performance of the program on the screen in front of you. There is, after all, only one thing happening on the computer.

Monitoring what happens in a multitasking environment is less straightforward. The system's performance is not identical with the performance of individual programs. Because most of what multitasking computers do happens behind the user's back, the performance of individual programs can vary wildly from one execution to the next depending on what else is hap-

pening on the system. Simply watching the screen to see how the program you're running is doing is not enough. Special tools are required to find out what is really happening on a multitasking system.

In the UNIX world, there are several different kinds of tools to help users interpret just what the system is doing behind their backs.

UPTIME

The simplest of these is "uptime." It has no arguments or command line options, and it reports the time of day, how long the system has been up, the number of users, and the load average over three time intervals (the last minute, the last five minutes, and the last fifteen minutes). Right now uptime reports the following on my system:

12:27am up 1 day, 9:24, 4 users, load average:
3.08, 3.04, 3.00

"Load average" is a wonderfully comforting concept: it reduces the load of the entire system to a single number. What this number really represents is the average number of processes in the operating system's "run queue" for the time intervals specified. For most of us, that fact is immaterial. We simply

know that the programs we want to run take longer to complete as load average increases.

"Uptime" is one of the utilities developed originally for Berkeley UNIX. It has recently been incorporated into various editions of AT&T's System V UNIX as well.

WHO

Naturally, once anyone notices that system performance has begun to degrade, there is a clamor for information that uptime cannot provide. Who, we ask with just the right combination of envy and annoyance, is responsible, and what exactly are they doing?

There are, of course, UNIX utilities to answer these questions. The next step up from "uptime" is the "w" utility, which, the manual promises, "tells who is doing what." "W" is a glorified version of the "who" command that produces a more or less human-readable summary of who is logged on to the system, how long their terminal has been idle, how much CPU time they've accumulated, and what they are doing. By default it produces this information in a "long form" which looks like this:

12:52am up 1 day, 9:49, 4 users, load average:
3.08, 3.02, 3.01

User Tty Login@ Idle JCPU PCPU What

root tty01 11:24pm 1:27 -

root tty0 11:25pm 5 w

root tty1 11:30pm 1:19 -

root tty2 11:33pm 15 -

The main drawback to the "w" command is that it reports only on "active" processes, and this may be a misleading slice of system activity. The command line options for "w" will vary from one implementation of UNIX to another.

PS

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Because most of what multitasking computers do happens behind the user's back, the performance of individual programs can vary wildly depending on what else is happening on the system.

happening on a UNIX system is the "ps" command, which can be used to report the status of all the processes on the system at any given time. By default it reports process id numbers (PID), controlling terminal (TTY), CPU time, and the command being executed. Its output looks like this:

PID TTY TIME COMMAND

0 ? 0:03 sched

1 ? 0:42 init

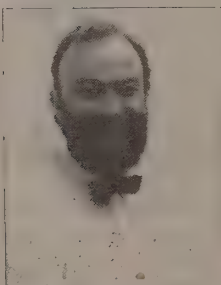
2 ? 0:10 vhand

3 ? 0:03 bdf flush

181 ? 1:43 auditd

226 ? 0:01 cron

232 ? 0:01 lpsched



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241 ? 0:01 deliver
313 ? 12:26 X
318 ? 0:14 xman
319 ? 1:43 xterm
320 ? 0:15 mwm
511 p0 0:33 vi

The ps command is one of the most frustrating UNIX has to offer. It exists in both Berkeley UNIX and AT&T UNIX, and is not a particularly easy command to use in either environment.

The AT&T version supports eleven command line options; the Berkeley implementation can claim sixteen options and qualifiers. To make matters even worse, the same command arguments often do wildly different things in the two environments.

The output of a "ps -el" command for the same system that produced the uptime and w output above is listed in Table 1 below. In this typical System V implementation, the "-el" options produce a long form of the process status report for all the processes on the system regardless of status. (By default, ps reports only on "interesting" processes.)

Under Berkeley UNIX, the "-l" option to ps also produces a long form of the report, but "-e" says nothing about which processes are to be reported. Instead, on Berkeley UNIX sys-

tem, ps -e triggers a report of the environment for each process. "ps -alx" is the Berkeley equivalent to the "ps -el" command under System V. Unfortunately, -x is an illegal option in System V.

For those who are not faint of heart, however, ps is a tool for getting detailed information about how the system behaves and why. It is the only tool available to provide a view of all the activity on the system. It can be used to monitor the rate at which programs accumulate CPU time, or the changes of state that processes go through as the operating system tries to apportion resources equitably. (The Berkeley version includes estimates of the percentage of CPU and memory resources each process consumes.) Ps can be used to trace parent-child relationships among processes.

Mastering ps is largely a matter of practice and reading the manual. The manual entry for ps in Berkeley UNIX is a difficult document to exhaust in one reading: "A process that has exited and has a parent, but has not yet been waited for by the parent is marked <defunct>; a process that is blocked trying to exit is marked <exiting>..."

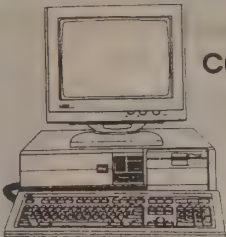
The unexamined life may not be worth living, but no one ever promised that the examined life would be any better. ■

Table 1: Output of ps -el

F	S	UID	PID	PPID	C	PRI	NI	ADDR1	ADDR2	SZ	WCHAN	TTY	TIME	CMD
31	S	0	0	0	0	0	20	531	530	0	d00d6f11	?	0:03	sched
20	S	0	1	0	0	39	20	3e3	2f2	28	e0000000	?	0:37	init
31	S	0	2	0	0	0	20	53	54	0	d00687d0	?	0:10	vhand
31	S	0	3	0	0	20	20	55	56	0	d00625b8	?	0:02	bdf flush
20	R	79	181	1	17	67	19	1c3	164	80		?	1:39	auditd
20	S	0	226	1	0	26	20	219	217	76	d00c1b5a	?	0:01	cron
20	S	0	232	1	0	26	20	73	2ac	136	d00c221c	?	0:01	lpschec
20	S	17	241	1	0	39	20	28b	392	104	e0000000	?	0:01	deliver
10	S	0	254	1	0	25	20	0	0	68	d00bb9c0	?	0:00	
10	S	0	255	1	0	25	20	0	0	68	d00ba34c	?	0:00	
20	S	0	313	312	0	26	0	422	423	868	d009d6a4	?	10:43	X
20	S	0	318	316	0	26	24	30f	132	432	d009d6a4	?	0:13	xman
20	S	0	319	316	0	26	24	40b	121	244	d009d6a4	?	1:19	xterm
20	S	0	320	316	0	26	20	30d	345	312	d009d6a4	?	0:15	mwm
20	R	0	511	321	1	26	24	1da	1f9	256		p0	0:17	vi
20	S	0	331	1	0	26	20	41f	413	408	d009d6a4	?	0:19	xterm
20	O	0	618	511	9	68	24	5e	1c7	268		p0	0:01	ps

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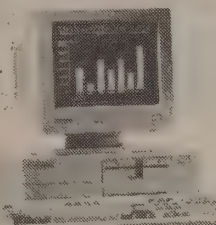
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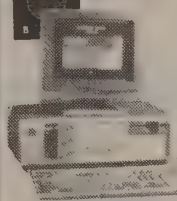
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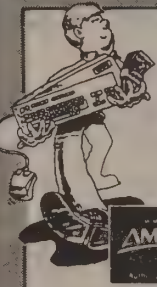
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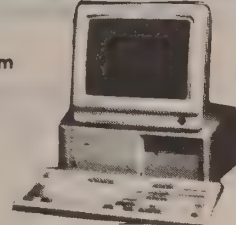
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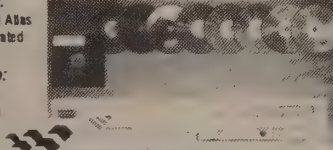
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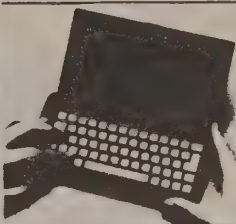
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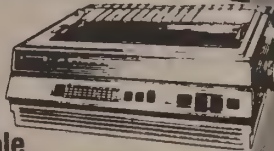


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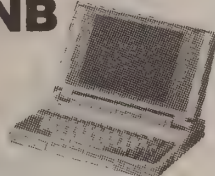
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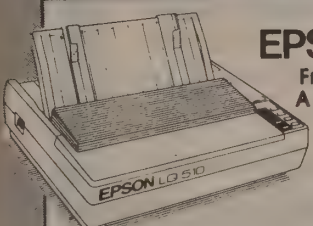
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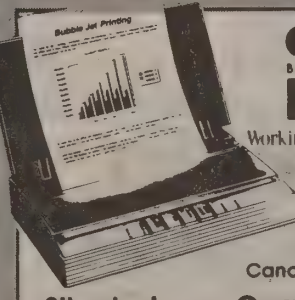
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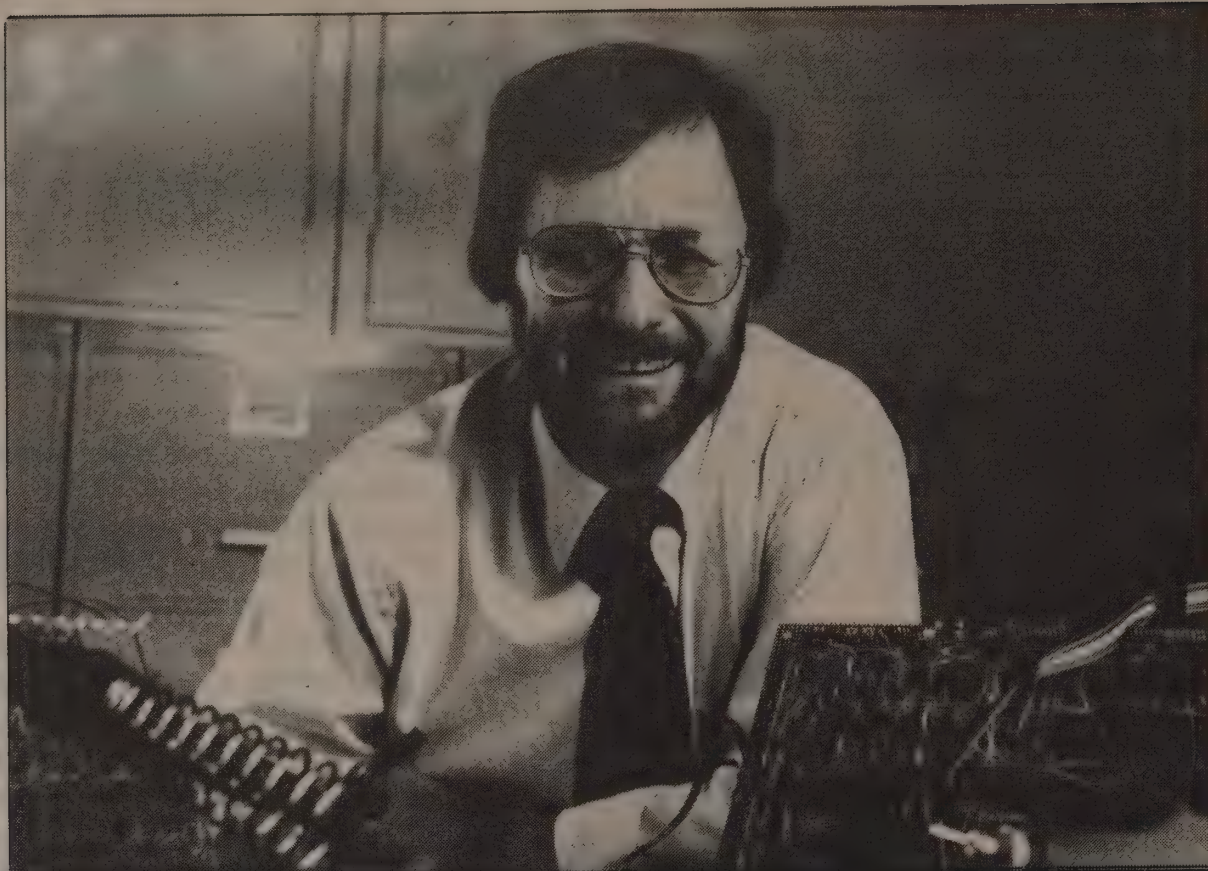
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PATENT #4,942,516

The Inside Story

In 1968, Gil Hyatt, a young inventor and entrepreneur, tried to start a company, Micro Computer, Inc., to sell products based on a new idea he had—a plan to integrate a number of functions on a single integrated-circuit chip, and render it capable of performing in a variety of system applications with minimal, or no, modification.

In 1990, twenty years after he applied for a patent on this technology, the US Patent Office has awarded him patent number 4,942,516 ('516 for short) for the invention of the single-chip integrated-circuit computer—the microprocessor.

Legal experts have categorized the '516 patent's claims as broad, and those claims could change not only currently accepted notions of history, but the US computer industry itself. What's more, '516, though obviously Hyatt's most significant patent, is just part of a portfolio of patents that impact existing microcomputers. Other Hyatt patents cover technology employed in keyboards and the use of DRAM, including synchronized processor refresh for DRAM, DRAM enhancement methods which he claims can eliminate costly cache in some applications, and several others.

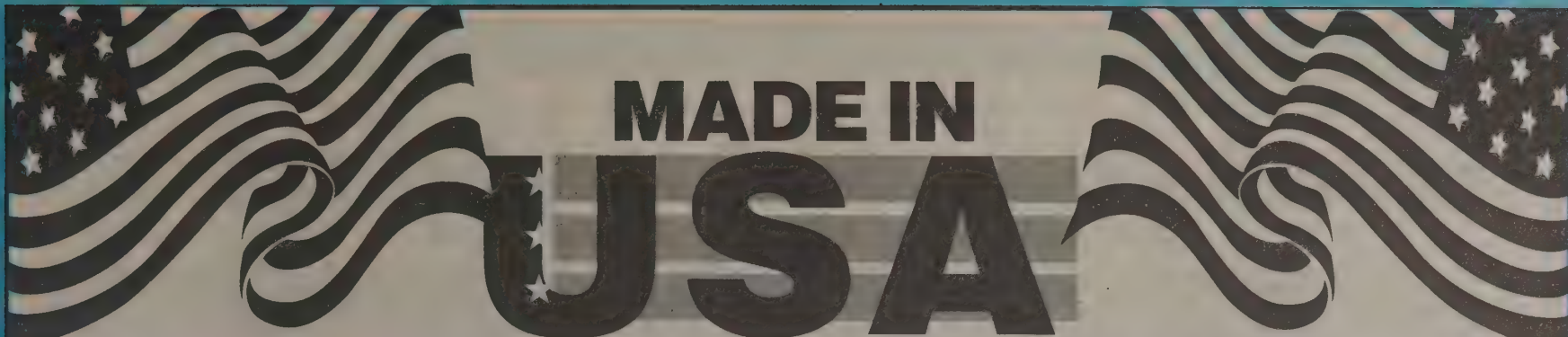
Until now, credit for development of the microprocessor has gone to researchers at Intel (Hoff, Mazor, Faggin) and Texas Instruments (Boone). However, the basic idea could very well have originated and spread from Hyatt's concepts. Hyatt is reluctant to talk about these possibilities explicitly, but there are hints in the history of his original company, Micro Computer, Inc. In fact, Hyatt's design seems, in many ways, more fully developed—more similar to today's advanced microprocessor technology—than one of the designs which immediately followed it.

This is the first time many parts of this story have been told—from the perspective of Gil Hyatt. In this interview, he explains his microprocessor technology, describes the ramifications of his patents, and responds to his critics.

Southern California engineer Gil Hyatt, recently awarded a patent on the microprocessor by the US Patent Office after twenty years, talks tech and tells tales

Story By Wayne A. Yacco

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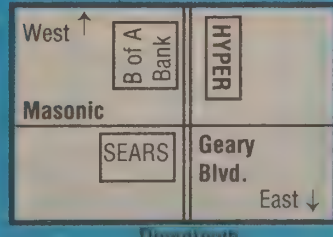
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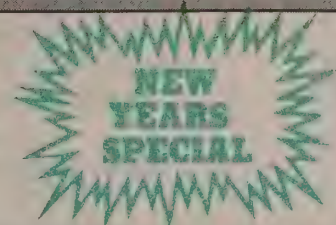
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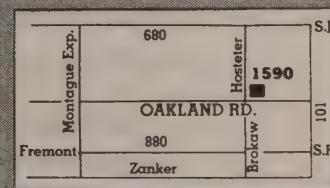
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The courts have decided that the technology in your '516 patent was a departure from the integrated-circuit designs that had preceded it. It was also a departure from the computer-system architectures that were employed in minicomputers of the day.

The business plan that I worked up in 1968 was based on a very interesting premise: The computer has previously been the dominant consideration in intelligent systems. When the computer becomes a chip, when it's no longer the dominant element, when you can scatter computers around like they were just chips, how do you build systems?

I came up with a range of systems including the desktop calculator, the computer terminal—which was a very important product back then—and a whole range of other business and scientific products based upon the single-chip microcomputer.

What was the state of the art in 1968 prior to your invention of the microprocessor?

There were a whole bunch of problems that computer designers of the time were up against, and they were proliferating the problems rather than solving them. In the mini-computer area, in order to take advantage of large scale integration, they were using it to make more complex computers—more instructions, more complex operations—rather than simplifying it and getting the pins reduced and simplifying

the computer. In addition, they always considered the core memory to be essential, and they were proliferating that dinosaur called the core memory.

They didn't see the advantage of simplifying the chip and then using software to accomplish their ends?

Well, that's a second point, and a very good one. They had these overstructured peripherals. Computers typically had an interface controller that isolated, or insulated, the computer and the program from the peripheral. It was a hardwired device that added substantially to the cost of the system. One of the aspects of my microcomputer system is, now that the cost of the computer is low enough, these interface controllers dominate the cost [of the system]. We've got to eliminate them, and one of the ways to eliminate them is by letting the microcomputer interact directly with the peripheral devices rather than going through these overstructured interface controllers.

So you're saying the interface is built into your chip design.

And under software control.

Is that in your patent?

Yes, as a matter of fact that is.

What about integrated circuit technology? How had that evolved up to the point where you put it together with the changes you saw as necessary in computer architecture?

The first ICs were like a gate on a chip. They were RTL, resistor-transistor logic. They had a resistor per input and a transistor buffer. Some chips had flipflops. That was SSI, small-scale integration—which then increased in size to where you got flipflops and multiple

gates on a chip. Medium-scale integration got more complex circuits like full registers, counters, adders, and the like.

Where did we go from having registers, counters, and adders? We still didn't have a microprocessor?

That's right. They didn't know what to do with large-scale integration. Once you got past the counter and the register type of circuit, the more you put on a chip, the more pins you needed—and other things. They were hardwired functions like adders which were general-purpose circuits.

What differentiates your original microprocessor design from the work that had preceded it?

The conventional computers in the middle and late '60s were core-memory-based computers. Core memories were considered to be essential. Multitudes of circuits interconnected together on printed-circuit boards were considered the only way to go.

Integrated-circuit memories were being used for very specialized functions. RAMs had just started to come out, and they were being used for high-speed scratch pad in conjunction with the core memory. No one was really working on eliminating the core memory. They were working on supplementing the core memories. They were trying to use LSI, not to get smaller computers, but to build their computers bigger and more powerful—completely missing the opportunity to make them smaller and readily available for multitudes of systems.

The solution to that problem, which I developed, was a computer architecture that had a combination of a ROM and a RAM. It stored the program and the fixed parameters in ROM—which was non-volatile—and it used the RAM as kind of a scratch pad to store the computed parameters.

How did that differ from the way minicomputers processed data?

They had one memory that was used for everything.

What are the basic components of a computer?

There's the ALU, which is the arithmetic and logic unit, the control unit, the memory, and the I/O section.

Are all of those functions except main memory on your chip?

The hooks for the I/O, a portion of the I/O is on the chip: the logic, the addressing, the control logic. But then a lot of the I/O registers, the interfaces to displays and keyboard, the interface circuits—those were off the chip. Those were more special purpose, and you wouldn't want to limit the chip with that.

In addition, after you get past the basic I/O circuitry—which has few pinouts and few interconnections—you start expanding out for the general and special interface. There you get a lot of pinouts, which would intensify the problem if you tried to put all of that on a single chip. So, where I partitioned my computer was that the basic, general-purpose I/O circuitry was on the chip, but all of the interface circuitry was off of the chip.

Prior to your chip, would those things all be implemented by different boards?

The minicomputers were getting into having one gigantic board with hundreds of circuits on it. Compared to a single-chip micro, minis were horribly unreliable.

The '516 patent has been described as being very broad. What does that mean?

The breadth of a patent has to do with how broadly the claims are drafted. A patent claim puts a fence around your invention, and identifies infringement if people are inside of that fence. A broad patent has a fence that covers a lot of ground, and is difficult to circumvent. A narrow patent is one where the fence is only around a small bit of technology, and is much easier to circumvent. Some of the claims are limited to a ROM, an operand memory, like registers or

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a RAM, and a processor, on the same chip. And that's a broad characterization of a microcomputer.

Would anything that had those characteristics fall within your patent's territory?

Yes. There are other limitations in the claim, but those are the fundamental ones.

I might add to something on that [patent] portfolio: One of the things my computer had in it was a dynamic RAM that was refreshed in synchronization with the computer. Some of the patents I have in this portfolio are very specifically directed to a DRAM used with a microcomputer and refreshed in synchronization with a micro—very fundamental technology that I developed back in the 1968 time frame.

Your patent award came as a shock to nearly everyone and, perhaps

because of the surprise, there have been some attempts to shoot holes in the validity of '516. The question has been raised, by some of your former associates, whether or not a microcomputer was buried in your products.

This has to do with the comments that these people never knew that there was a microcomputer buried in the system, and that it was a machine-control system and not a microcomputer—even though the company name was Micro Computer, Inc.

One would think that some deliberation was required to settle on that particular name for the

company. It is rather specific. Nevertheless, some charges have been leveled that your design is really a microcontroller, not a microcomputer.

Certainly microcomputers and microcontrollers are different facets of microcomputer technology. The claims of the '516 patent are broad claims that clearly cover both microcomputers and microcontrollers, and I think that future licensing activities will establish that the patent does cover both.

What is the distinction between the two?

I think the erroneous basis of those types of issues is that some of the [patent] claims require a ROM on the chip, and the ROM stores instructions. Some of the computer chips out there have ROMs on them, and people are saying, "Well, those are microinstructions, and therefore, somehow different." But that's splitting hairs. I was told that Intel just had a court decide that microcode comprises instructions. It's a court decision, but we all knew that anyway.

I think you'll find that that issue will evaporate a short ways downstream. People were in a hurry to take potshots, and they sort

of shot from the hip. They came out with a lot of things that were misleading.

So they're saying that because you have programs stored in ROM on the chip itself, you've designed a microcontroller and not a microprocessor?

Yes. They say that the difference between a microcontroller and a microprocessor is that a microcontroller has instructions on the chip while a microprocessor has microcode on the chip.

Critics have described you as being more interested in patent applications than in hardware development.

Certain people have been quoted as saying that I was preoccupied with piles of paper for patent applications and not working on hardware, when the opposite is true. The patent attorney who prepared the application, Gregory Roth, said I was a difficult client because I was preoccupied with building hardware, and I didn't have the time to give him so that he could write the patent application.

Former colleagues have also accused you of not wanting to share your technology, and, it has been said, that is why MCI folded.

No, that's ludicrous. The company always had the rights to it. Micro Computer, Inc. had an exclusive license for the technology. The reason that the investors wanted an assignment is because they wanted to sell off the technology and kill the company.

Sell to whom, Intel?

I can't comment on that. They threatened to sell off the company, and they told me, "Assign the patents to the company so we can sell it off." I said, "No, I want the company to survive; finance the company."

It wasn't that the company didn't have the rights. The company had all the rights it needed to exploit it. I just would not give these other people my technology to sell off for their own purposes.

You're saying they would have just sold your assets, walked away with whatever money they could get, and left you without a company?

Exactly. It's not that I wouldn't have given them the patent. They just didn't have the right to sell the technology to someone else. I held the rights to prevent them from selling it off. Anyone who complains about that today is really making up a story. Most companies license patents; they don't assign them to others. That's sort of sour grapes by people who are trying to reconcile what they did back in that time frame. What they did was improper.

When I refused to go along with their threat, they closed down the company, expecting the patents to evaporate, and me to get lost. So then, they could go off and do what they wanted with the technology. Because they breached the license agreements by closing down the company, by nonpayment of royalties and such, I terminated the license agreement to the company. The company no longer had the rights to it.

One of your former associates at Micro Computer, Inc. has also reportedly criticized '516 as a paper patent, and as a wish list—based on technology developed later—of what you would have created if you could have foreseen an ideal design. The implication seems to be that '516 has somehow been changed over the many applications that were required to get your patent issued.

These comments about the invention being enhanced as time goes on were put to bed by the court of appeals which said that the material pertaining to the single-chip micro is in the '70 case.

Relative to the paper patent, that's equally ludicrous, because I had a company of twenty-five people building hardware and programming hardware. So, there's no paper patent involved. "Paper patent" means you just thought of it, you never built it.

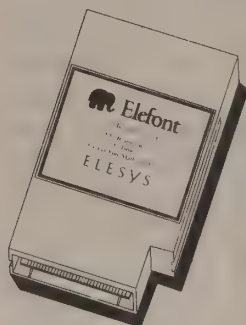
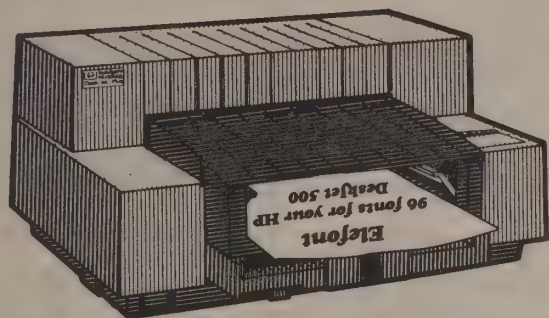
Haven't many of the companies that are out there criticizing '516

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been taking advantage of paper patents right along?

Of course. Most patents, at issue, are paper patents. Most of the patents I've seen were paper patents in that the things had not been properly developed by the time the patent was filed. Mine is not a paper patent. Although there's nothing wrong with a paper patent.

There were some statements by people in the [San Jose] *Mercury News* article [December 2, 1990, "West," p. 24] that talked about the system never working. Well, now we had taken on a very difficult job and had some very good results. Here's a letter from a customer of the Micro Computer, Inc., CONTOURAMA IV system, and he says it's working excellently. [Hyatt produces a photocopy of a letter on Electragraphics letterhead, with a 1971 date.]

This is a production system for machine control, and it was delivered to Electragraphics, which was using it in a production environment. He says, "May I thank you for a fine and total system."

And you contend this could have been turned into a chip, and would have been, if MCI had continued to exist?

The computer in this would have. What happened was, I had gotten investors involved in Micro Computer, Inc., who would help me build the chip. And, in fact, we had embarked on those discussions.

With Intel, or TI, or both? [One MCI board member (Chulick) was a representative of a large Intel investor (Hambrecht and

Quist) and another member (Lubitz) served both companies as patent attorney.]

With both. And that was in the early-to-middle 1969 time frame.

So you have really talked to them about working with this technology. They knew a lot about it at the time, and from many different contacts.

Well, I think they are all related.

Were there ever meetings with Intel's [Robert] Noyce or [Gordon] Moore?

I never had any meetings in that time frame with Dr. Noyce and Dr. Moore. There were telephone conversations, but not actual meetings.

Do you have records of the subjects raised in those conversations?

I can't discuss that.

The *Mercury* article has a very interesting statement that Dr. Noyce didn't know about my pending patents on the microcomputer, and that's just the opposite of the situation. I have correspondence with Dr. Noyce, and we had telephone conversations addressing my continuing patent applications on the micro computer technology.

I corresponded with him through the mails, and I spoke with him on the telephone up to a very short while before his passing earlier this year. So, it's not that he didn't know. He was expressly told about my continuing microcomputer patent activities [circa 1980].

So you'd like to go on the record that Dr. Noyce knew about it right

from the beginning?

Well, he certainly knew about it during my patent enforcement activities. I don't know when he became informed, but I informed him verbally and with correspondence. So, this is just the opposite of the true position—the *Mercury* article says that Dr. Noyce expressly did not know about it, and the converse is the truth.

Some of the things we've been discussing seem to be new for the record.

I think some of that was information that's never been given out—the communication with Dr. Noyce was completely different from [the *Mercury* "West" article]. The success of the Micro Computer, Inc., products was never addressed by anyone else.

In other words, the *Mercury* article said you couldn't sell a product in the marketplace so you folded up?

They never quite said that, but they quoted guys saying, "The damn thing never did work." I've got a newspaper clipping—from when MCI folded—telling how great they [MCI products] were.

Will your patents increase hardware prices?

They shouldn't. My patents should actually reduce prices on hardware. For example, the memory accelerator should reduce the requirement for higher-speed memory techniques like cache memory and high-speed DRAMs, and should reduce the need for SRAMs.

So, what's wrong with DRAM?

DRAMs are marvelous components. They're dense, they're low in cost, they're really neat, but they've got a horrible flaw. They are slow. One reason they're slow is that they've been misused over the past two decades.

They're faster than cores though, aren't they?

Oh definitely, but they're slower than the computers that they have to be used for. So, they often use either wait states to slow the computer to the DRAM speed, or they use cache memory to attempt to compensate for the slowness of the DRAMs, and, consequently, increase the complexity and the cost of the systems. This also causes incompatibilities with software, because some software doesn't like cache memories.

Just what does that accelerator patent contain that can replace fast DRAM, SRAM, and cache at a lower cost?

My DRAM enhancement technology recognizes that there are a lot of unnecessary cycles typically used with DRAM operations. It uses a circuit for detecting the different type of cycles, and when it detects an unnecessary cycle, it drops that cycle.

What do you mean by "unnecessary"?

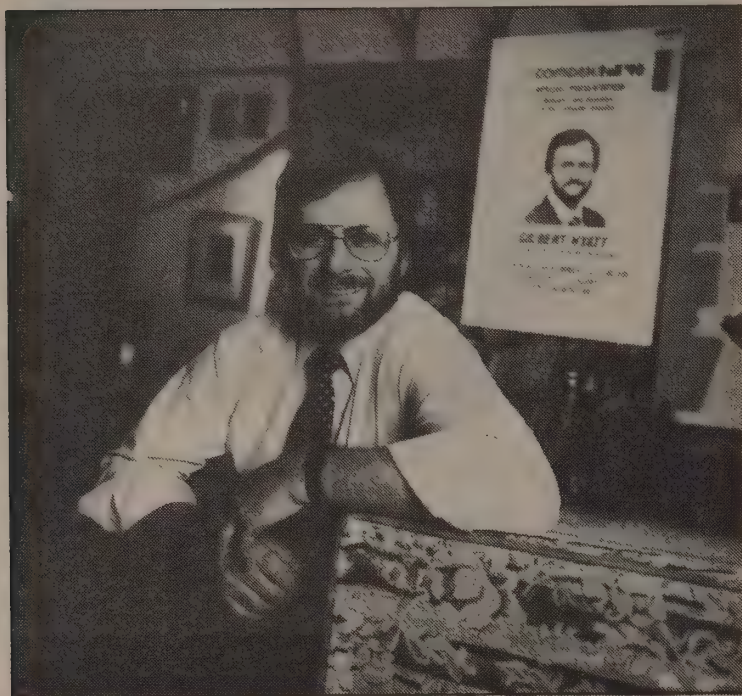
In the personal computers that use wait states, the DRAMs operate with a multiplexed address, a two-part address called a "row address" and a "column address." The row addressing is extremely slow, the column addressing is faster, but still relatively slow.

So addressing is performed in sequence?

They do a sequence of RAS and CAS—row addressing and column addressing—often the row address is unnecessary, and sometimes the column address is unnecessary, if the memory is architected properly. If the memory has already been addressed, and you have the correct row, you can eliminate the RAS cycle.

Also, in current personal computers, they have banks of memory. Operations are performed in one bank almost exclusively, and then they transfer to another bank. However, if the memory is architected so that you're actually operating across banks, you can get up to 600% increase in speed, because the chip-select signal, or the CAS enable signal which sometimes does the chip select, operates about six times faster than a full RAS/CAS cycle. A lot of times you can scan out across the banks with significant speed enhancements by not invoking

Continued on page 234



Hyatt hopes to use revenues from his patents to develop more innovative products

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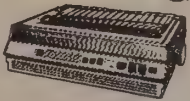
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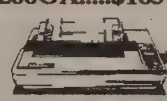


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*24 pin 192 cps
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*LCD Control Panel
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	Nanao 8060S.....\$559
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Everex 2400 Int/Ext....\$129/179
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Drum Unit	119
Developer	89

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- 250 sheet capacity
- 300 dpi resolution
- 512K RAM exp. to 4.5MB

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- 2MB RAM exp. to 4MB
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Toner	39
Drum Unit	149
Developer	99

\$1999

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- 300 DPI resolution
- 5 printer emulations
- 512K RAM upgradeable to 1.5MB
- One year limited warranty

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TWO YEAR LIMITED WARRANTY

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• NO254 ABCD 25PIN (Parallel)	19 ⁹⁵
• NO252X AaBb (Parallel)	21 ⁹⁵
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• NO364 ABCD 36PIN (Centrenic)	21 ⁹⁵
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brother

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NX-1000 R 144 cps, 80 col, 9-pin	199

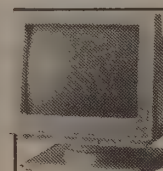
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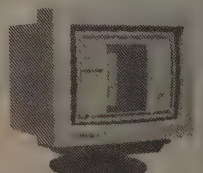


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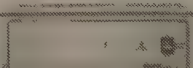
AUTO SCAN SWITCH, BUFFER CONVERTER

This auto scan switch allows multiple computers to share one printer without the need for manual switching.

• MP401 4 computers share one printer (DB25 parallel)	\$108
• MP801 Same as MP401, except using 8 ports	135
• MS401 4 computers share one serial peripheral	114
• MS801 Same as MS401, except using 8 ports	139

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| • Overload & short-circuit protection | • Overvoltage protection | • Overload & short-circuit protection |
| • Batteries always on charge | • Batteries always on charge | • Push to test switch |
| | • DB9 UPS monitoring port | • DB9 UPS monitoring port |

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- 4 computers share 2 printers • Auto scan or key switch with 256K buffer
- Transfer rates 1K a byte/sec/port • LED display, which shows quantity of copies, can be easily set by + or - button

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AMS 2400 Baud Internal Modem \$79

5 year warranty • Made in U.S.A.



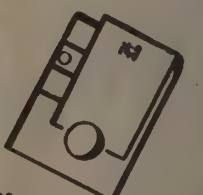
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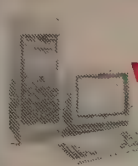
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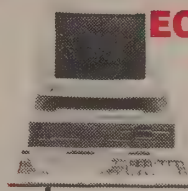


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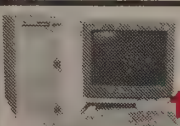
ECI 386-33MHz w/64K Cache System w/104MB Hard Disk **\$1595**

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- Standard AT Case w/220 W Power Supply
- 101 Keytronic keyboard
- Ideal for Desktop Publishing, CAD and Network Service
- Made in U.S.A.
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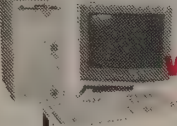
ECI 386-25 MHz System W/40MB Hard Disk **\$1145**

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- 1 MB RAM expandable to 16 MB
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- Standard AT Case w/220 W Power Supply
- 101 keyboard
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- Made in U.S.A.
- One Year Warranty on Labor & Parts



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- 80387SX Math Co-processor Socket
- 6 x 16, 2 x 8 bit slots
- 1.2 MB or 1.44 MB Floppy Drive
- 40 MB 28 ms Hard Drive w/controller
- I/O 2 serial, 1 parallel, 1 game
- Real time clock w/battery backup
- MINI Vertical Case w/200 W Power Supply
- 101 keyboard
- An affordable system w/386 power
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- One Year Warranty on Labor & Parts



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- 1.2 MB or 1.44 MB Floppy Drive
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- I/O 2 serial, 1 parallel
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- MINI Vertical Case w/200 W Power Supply
- 101 keyboard
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- Made in U.S.A.
- One Year Warranty on Labor & Parts

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387DX-25	440
387DX-33	540

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NEC Multisync 2A 800 x 600	450
NEC Multisync 3D 1024 x 768	595
Sony 1302A 900 x 560	579
Sony 1304 1024 x 768	659
Goldstar EGA Monitor 640 x 350	285
Goldstar VGA Monitor 640 x 480 0.39	305
Goldstar Monitor 600 x 800 0.31	350
Panasonic C1381 1024 x 768 0.28	399

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XT Hard Disk Cont	49
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ATI 16 bit VGA 1024x768 256k(wonder) w/MOUSE	215
Serial/Printer/Game Card	16/16/16
MFM 1:1 HD/FD Cont	69
IDE Dual HD/FD Cont	35
SCSI 1:1 HD/FD Cont	275
ESDI 1:1 HD/FD Cont Ultrastore w/32K	190
RLL 1:1 HD/FD Cont	98
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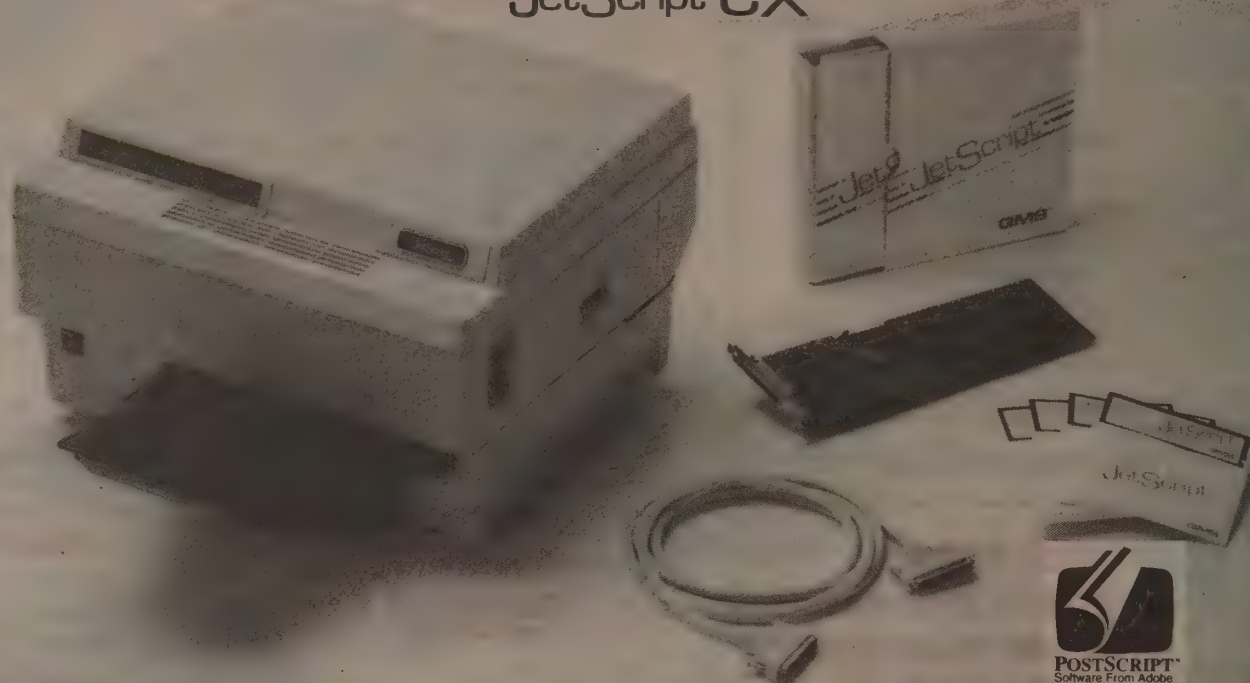
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Same system with a NEW Canon printer is only \$1195.

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FEATURES:

- 16 MHz 68000 processor.
- 35 resident Adobe typefaces scalable from 4 points upward. Fonts can be rotated to any angle in 1 degree increments.
- 3 megabytes of RAM on board.
- Canon laser printer, 300 dpi, 8 ppm, 300,000 page life with 120 sheet paper cassette.
- Easy installation. Fits any PC/XT/AT or compatible (1 full-size slot).
- Authentic Adobe PostScript — not a clone.

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- 2-3 times faster than printers with PostScript cartridges. 5-10 times faster than PostScript software emulators.
- Any font is instantly available at any size without taking up hard disk space. Compatible with Adobe's font library (over 700 typefaces) and with Bitstream fonts.
- Full page 300 dpi graphics plus enough extra memory for 12 additional downloadable fonts.
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THE 4th ANNUAL MICROTIMES

100

Our Annual List Of Industry Leaders—For A Turbulent 1990

Well, there have been some strange years in the microcomputer industry, but 1990 is probably destined to lead the list for some time to come. The year had more dramatic reversals than Othello. Last winter, anybody who predicted, say, Gil Hyatt's patent on the microprocessor, or the return of David Packard, or Ashton-Tate's apparent loss of its crown jewels, or, for that matter, that there would be a runaway bestseller based on a hole in GNUEMACS, wouldn't have found much of an audience. But 1990 was that kind of year.

You'll probably find a lot of unfamiliar people on this list. To some extent this reflects a turbulence in the industry, with leaders falling and upstarts rising to power. It also reflects a sense that, in many cases, some of the most significant accomplishments of the year had less to do with spectacular achievement than with long-range strategic positioning.

There's also something we're quite happy about—a lot of reader response telling us of unsung souls who just went out and did something good in 1990. Sometimes it's life-changing, and sometimes it's merely entertaining, but we are delighted to recognize the work of these folks.

—MicroTimes Editors

Sheldon Adelson

CEO and Chairman of the Board
The Interface Group



What can you say about an enterprising show promoter who seems to be rapidly buying up Las Vegas, the better to put on COMDEX?

One popular answer seems to be, "Hey, man, build a few parking garages!"

Alan C. Ashton

President

W.E. "Pete" Peterson

Executive Vice President
Word Perfect Corporation

In 1979 Ashton and co-founder Bruce Bastian wrote a word processor called WordPerfect to run on Data General minis and, a year later, hired Peterson to handle the day-to-day business operations. Today



WordPerfect, still owned by Ashton, Bastian, and Peterson, is the third-largest personal computer software company (after Microsoft and Lotus) in the country, its word processor running on every-

thing from mainframes to the Poqet.

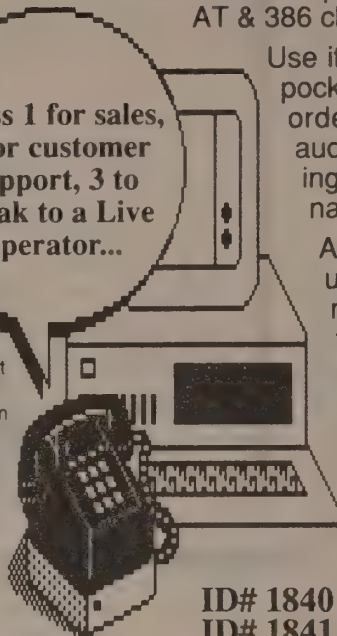
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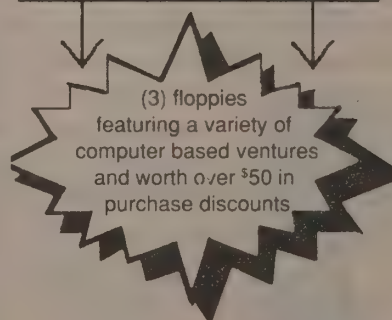
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MAN OF THE YEAR



Gil Hyatt

Inventor

For twenty years, La Palma resident Hyatt has maintained that he invented the microprocessor. This year his quiet persistence paid off—he finally got the Patent Office to agree with him. (See cover story.)

It might, of course, be another twenty years before the full implications of Hyatt's patent unfold. But in an unusually chaotic year where few things seem to have gone entirely according to plan and everything we knew frequently turned out to be wrong, we think he deserves recognition, not merely for the significance of his invention, but for keeping the courage of his convictions through a two-decade, self-financed struggle.

And also for affording a prime example that in this business, you just never know what's going to happen next...

standard is always helpful to your company's bottom line, what sets WordPerfect apart from its competitors is its fanatical attention to customer support and willingness to listen to feedback. At a time when almost nobody else does this, WordPerfect still offers a toll-free customer support line and devotes approximately a third of its personnel to this purpose. A side benefit is highly interactive product design—when WP shipped its first Macintosh version, it wasn't too successful. But it paid attention to its customer feedback, and the new version 2.0 is elegant and Mac-ish enough to draw praise from the ultimate arbiter of Mac taste, Guy Kawasaki.

Don Armstrong

**Director of Engineering
Elographics**

Elographics is a Tennessee-based touchscreen manufacturer with offices in Fremont, from which enthusiastic employee Marcus Johnson writes in to sing Armstrong's praises. Says he, "While other companies are copying our product and still laying off, this man has developed Elographics in the West."

Nick Arnett

**Editor
Multimedia Computing
& Presentations**

Reader Bill Orr of Fremont is an avid fan of Arnett's (and publisher Tim Bajaran's) newsletter. He says, "Nick brings understanding of what's happening to his five hundred or so sub-

scribers. He is an important catalyst for cross-pollination of ideas in the industry. That's important!"

We agree. We also like the newsletter.

BMUG

(A cast of thousands)

Not just a Mac group, BMUG is the information source, networking mecca, and product proving ground for the Bay Area computer community—and by its extensive worldwide connections, the world. At BMUG meetings, intrepid product vendors brave the toughest crowd in the business to show off their latest creations, the newest public domain software finds a receptive audience, and detailed (and often conflicting) opinions are given on practically every subject.

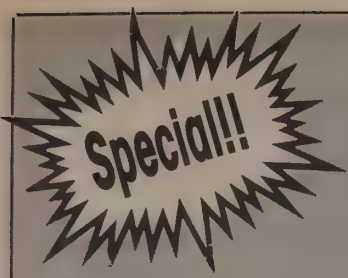
John Perry Barlow

Mitch Kapor

Founders

Electronic Frontier Foundation

EFF was founded as an indirect result of visits to Kapor and Barlow from FBI agents in search of Nu-Prometheus code. In its first six months of existence, it's served as a forum to explore issues relating to what Barlow calls the civilization of cyberspace. In a very short time, the organization has succeeded in drawing public attention to crucial issues that remain undefined as electronic communication grows and diversifies—from constitutional protections to long-range planning of the



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486-25 MHz System

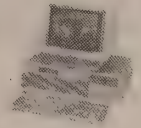
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- 101 Keyboard
- Case w/Power Supply



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386-33 MHz 64K Cache System

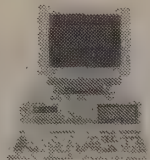
- 1 MB Expandable to 8 MB
- 64K Cache Memory
- TEAC 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave FD/HD Controller
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



\$1115

386-25 MHz System

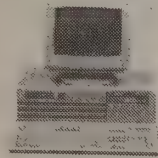
- Intel 25 MHz CPU
- 1 MB RAM on board
- C & T NEAT Chip Set
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy Drive
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



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386-SX 16 MHz System

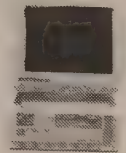
- Intel 386-SX CPU
- 1 MB RAM on board, Landmark=21.6
- C & T NEAT Chip Set
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB Floppy
- Serial, Parallel, Game Port
- 101 Keyboard
- Choice: Regular Baby Case or Small Vertical Case



\$650

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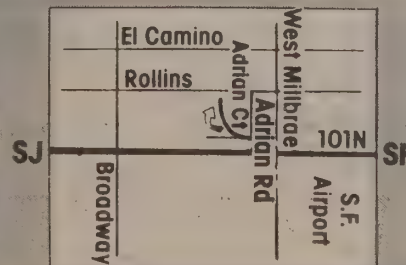
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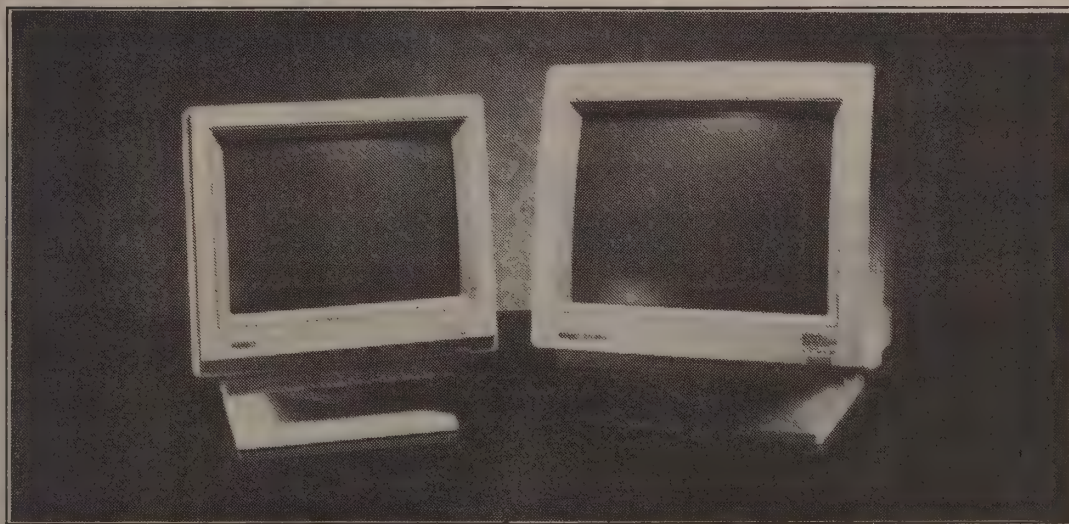
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next century's communication tools. EFF has served as a powerful catalyst for bringing together representatives of crucial groups that don't usually talk to each other: district attorneys and FBI agents, hackers and phone phreaks, civil libertarians, computer security experts, industry leaders and interested bystanders meet, online or otherwise, for sometimes acrimonious and usually high-quality discussions of matters that will affect us all in decades to come.

Michael Boich

President and CEO

Andrew Singer

Vice President of Engineering
Radius Inc.

It's not news that Radius is a vendor of excellent graphics products, and this year it broadened its operations to include PC hardware and video subsystems.

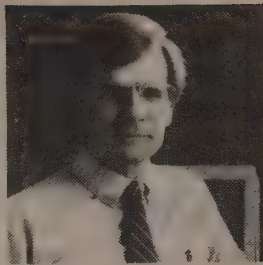
However, we think the company should get some kind of recognition for coming up with the product that most closely reflected the state of the industry in 1990: The Radius Pivot, the rotating monitor.

Paul Brainerd

President

Aldus Corporation

During 1990, Aldus not only shipped new versions of PageMaker, further consolidating its leadership in the desktop publishing world; it also acquired some distinguished products and slick graphics technology when it purchased Silicon Beach Software in



Wendell Brown

President

Will Glaser

Director of Engineering
Hydra Systems, Inc.

Hydra's cofounders have kept their plans under wraps for two years, dropping enticing hints of revolutionary technology and strategic agreements with Xerox. In December, they preannounced their first product, the Hydra One, a 68000-based hardware/software combination that will allow IBM PC owners to run Macintosh applications and achieve faster-than-Classic speed.

No word yet on what Apple might think about this, but if the product delivers on its promise, it's great news for PC users and Mac software vendors in search of a bigger installed base.

Lucius Bunton

Federal District Court Judge (Austin)

If ever there was a year for Litigation's triumph over

February. With leading products at all points of the publishing spectrum, plus a full range of bestselling graphics packages and SuperCard, Aldus is positioned to take advantage of the computer environments of the '90s.

Innovation, 1990 was it. The trend shows little sign of abating, either.

A rare light in the murk was Judge Bunton.

Assigned the task of deciding the merits of suits and countersuits between Motorola and Hitachi, each of which was said to infringe on the other's technology in its respective 68030 and H8 CPUs, Bunton was openly critical of the apparent preference of the lawyers to drag the litigation out till doomsday rather than settle their differences. By way of encouraging the parties to adopt a more reasonable frame of mind, he ordered both Hitachi and Motorola to stop selling the chips involved until they reached a settlement.

We'd like to report that it worked. Instead, of course, Motorola and Hitachi's lawyers each decided to appeal the rulings and Bunton stayed his non-distribution order.

Late in the year, Motorola and Hitachi settled without much fanfare, giving little reason to believe that the result was substantially different from what would have happened in the spring, when Bunton tried to induce them to reach an agreement.

Jim Button

Chairman

Association of Shareware Professionals

The shareware vendors' professional association worked with Congress in 1990 and succeeded in warding off provisions in the software rental bill that would have threatened shareware copyrights and resulted in a government shareware office. Said Button, "This isn't the first time shareware copyrights have been jeopardized and it probably won't be the

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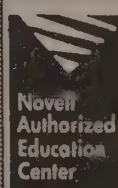
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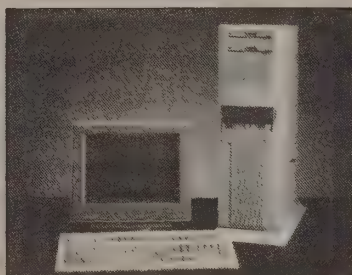
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SABER SYSTEM

25 MHz 486

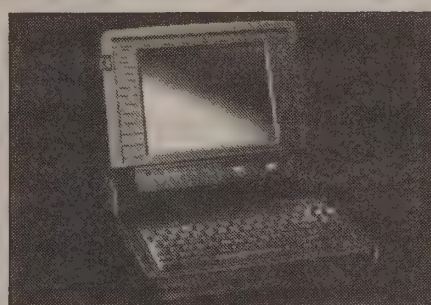


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See PC Magazine May 28, 1991 for review of this system!

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- 40 MB Hard Drive
- VGA LCD Screen
- 1.44 Floppy Drive
- 1 MB expandable to 4 MB
- Removable Keyboard

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Laptop & Windows 3.0

\$1995

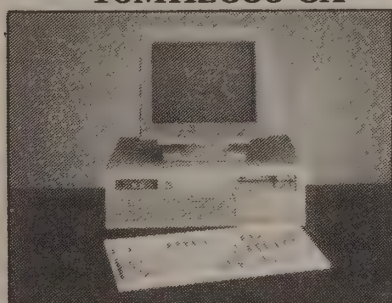
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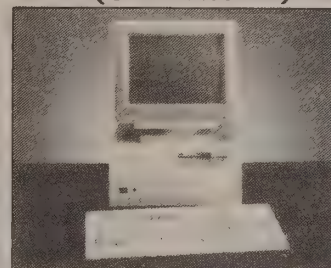
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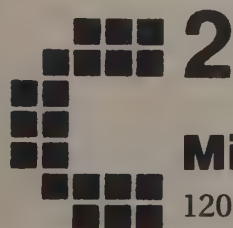


"One of the best 33-MHz 386 computer buys is the C² 386/33, sold only through authorized dealers. C² Microsystems is happy to custom-configure systems with just about any combination of components you specify, and at a price that won't blow your socks off."

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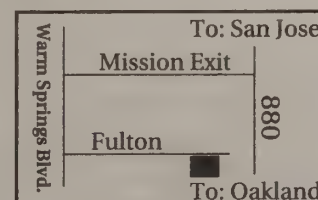
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last. We won another skirmish in an ongoing battle."

Rod Canion

President and CEO
Compaq

Canion may be one of the industry's less flamboyant leaders, but lack of hype doesn't denote lack of results. Compaq is now second only to IBM in sales of personal computer hardware in the US, and as to the future, who knows? The EISA bus standard, which it promoted in opposition to IBM's proprietary Micro-Channel, has won wide support among other clone vendors and has quickly become a major platform. Compaq also continues with leading-edge innovation, as exemplified by the LTE notebook computer and the Systempro network server, and shows no sign of slowing down.

Doug Carlston

Co-Founder, Chairman, and CEO
Brøderbund Software

Carlston celebrated the tenth anniversary of the company he and brother Gary co-founded in 1980 after a chance encounter at the Computer Faire with a Japanese software company. "When I look back," he remarked, "I see that many of our most important changes grew out of decisions that didn't seem particularly important at the time. They weren't things we planned. That's why I suspect there's something important growing right now—like a seed below the ground—that will eventually blossom. Perhaps it's something obvious. But on the other hand, it might be something that we think is a weed, struggling along over in the corner. I just don't know. That's what keeps this business so fascinating."

Jim Clark

Chairman

Ed McCracken

President and CEO
Silicon Graphics

In the workstation world, SGI's Iris machines have made their mark for spectacular graphics and high performance at relatively low cost. In 1990, the company scored a major coup by making the power of Iris available on PCs, introducing the IrisVision cards supporting both the MCA and AT bus standards, and offering compatibility with MS-DOS, SCO Open Desktop, and Windows 3.0, bringing affordable real-time graphics capability to a huge installed base of users. Industry figures like Bill Gates hailed the move, but we have a feeling the real excitement is going to come from a whole lot of PC graphics users.

Lisa Cohn

Founder and Director
Special Technology Center

Lisa Clark of Mountain View wrote to us about Cohn and STC, saying that Wells Fargo Bank, Clark's employer, had been so impressed with Cohn's work that

they donated space at the bank's Mountain View office for the organization's new facility.

Her son's cerebral palsy led Cohn to explore new uses of the computer for people with physical disabilities, and the result was STC, a community access center where people learn to use high-tech tools (and toys!) to overcome physical obstacles. Children who can't speak have new worlds opened to them with speech synthesizers. A special keyboard helps a wheelchair-bound writer resume his career.

Cohn has managed to do this with very little money—both IBM and Apple have donated equipment, and she has a small staff and lots of volunteers. Since 1987, more than six hundred children and adults have taken advantage of the program.

Steven Cook

President

Michael Burdick

President

Edwin Billiot

CFO

Paperback Software

Among the clear losers in the Legal Wars Of 1990 was Paperback Software, whose fortunes suffered considerably when the judge in the long-running look-and-feel suit determined that Paperback's VP-Planner did indeed infringe on Lotus's copyright on 1-2-3. (Heartened by this outcome, Lotus lost no time in suing Borland and the Santa Cruz Operation on considerably farther-reaching extensions of the principle.)

With erstwhile president and CEO Adam Osborne out of the picture, Paperback's management is now faced with the unenviable task of keeping the small company afloat in spite of being unable to sell its most successful product, and they're making the hard choices to be able to do so. They decided, for instance, to continue supporting current VP-Planner users; they also decided not to expend any more of the company's resources on fighting Lotus in court, and to focus on its other products, including VP-Expert, the best selling PC-based expert systems package on the market.

Harold Copperman

President and COO

Commodore Business Machines

Not only has Copperman survived in the presidential hot seat considerably longer than most of his recent predecessors, he's done an effective job of turning the floundering company around and bringing the Amiga to a stronger position in the marketplace. 1990 saw the release of the long-awaited Amiga 3000 and other significant hardware, as well as increased acceptance of the machine in the professional video and animation markets.

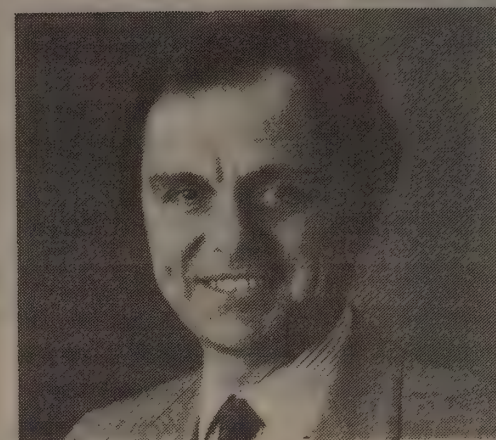
Wilfred J. Corrigan

Chairman and CEO

LSI Logic

Corrigan, who founded LSI in 1981, has turned the company around for record earnings after a year of losses and reorganization in 1989, and in the process consolidated its strategic position for the '90s. Its application-specific integrated circuits (ASICs) are key components of products including Silicon

THE 4TH ANNUAL STEVE JOBS WHAT'S NEXT AWARD



Jean-Louis Gassée.

As befits a turbulent year, we find ourselves with a plethora of candidates for this year's award, including its namesake. But first, a little Where Are They Now for previous years' recipients.

1987's winner, Steve Jobs His Badself, confounded his detractors by coming out with an awesome NeXT generation of hardware. The jury's still out as to whether NeXT technology will thrive on its own or survive merely as an alternative interface to IBM's RISC boxes, but St. Steve has once again managed to generate a goodly amount of product—rather than lawsuit-related excitement in the industry, at a time when it was sorely needed.

1988's winner was David Bunnell, who had departed from PC/Macworld and his other IDG publications and was planning to start a NeXT magazine. Bunnell continues to be particularly active in the community, notably in the Computers and You program at Glide Memorial Church in San Francisco, but the magazine never materialized. (IDG and NeXT, however, started *NeXTworld*, which should be on the newsstands any minute now.)

1989's award recipient was Lotus founder and 1-2-3 designer Mitch Kapor, who more or less epitomized the What's NeXT? ideal in 1990. This time last year, we were waiting with bated breath for the long-awaited first product of On Technology, Kapor's Mac startup. While On Location turned out to be quite a nice product, Kapor's big surprise, undreamed-of a year ago, was the Electronic Frontier Foundation.

Which brings us to this year and our plethora of likely candidates. Adam Osborne, off with yet another startup? Guy Kawasaki, currently working on another book? David Packard, back from retirement to restore the H-P Way?

Time will tell. However, we're giving this year's award to departed Apple executive Jean-Louis Gassée, who's currently very close-mouthed about his new startup, Be Labs, and its product, if any. While we don't have any inside track on what he's up to either, we think it's going to be pretty interesting to watch.

David vs Goliath

How does CHAPLET's LA-30A Stand Against TOSHIBA's T3100e?

PORTABLE COMPUTING, February 1990

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◆ Connectivity ◆

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◆ Portability ◆

Chaplet's HALIKAN equips with an internal rechargeable battery pack, one of only a handful of laptops that feature the low power CMOS version of Chips and Technologies' NEAT chipset.

◆ Expandability ◆

Chaplet's HALIKAN offers more flexible expansion scheme that permits one 8-bit and one 16-bit expansion slots.

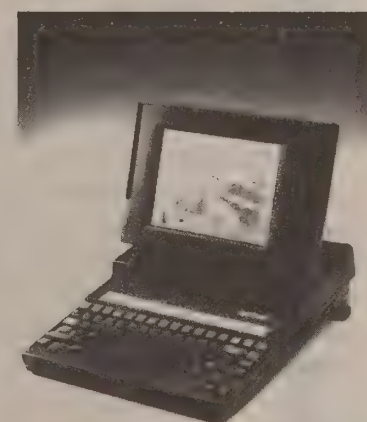
◆ Documentation ◆

Chaplet's HALIKAN supplies a well-written, illustrated, easy to understand, and logically organized manual. It comes with tutorial that shows you how to set up the NEAT chipset for special RAM configuration.

The choice for Chaplet's HALIKAN has an overall computing performance and the most cost effective retail price for you.



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Clock & Calendar Yes	Clock & Calendar Yes	Clock & Calendar Yes	Clock & Calendar Yes
Display VGA w/16-pin External Port	Display VGA w/16-pin External Port	Display CGA w/9-pin MDA/CGA Port	Display CGA w/9-pin MDA/CGA Port
HDD 40MB/80MB/120MB	HDD 40MB/80MB/120MB	HDD 20MB/40MB	HDD N/A
FDD One 1.44 MB	FDD One 1.44 MB	FDD One 1.44 MB	FDD Two 1.44 MB
Expansion Slots One 8-bit, One 16-bit	Expansion Slots One 8-bit, One 16-bit	Expansion Slots One 8-bit, One 16-bit	Expansion Slots N/A
Math Copr. Socket 387sx	Math Copr. Socket 287	Math Copr. Socket 287	Math Copr. Socket 8087
Battery Yes	Battery Yes	Battery Yes	Battery Yes
I/O Two Serials, One Parallel, One Keyboard	I/O Two Serials, One Parallel, One Keyboard	I/O Two Serials, One Parallel, One Keyboard	I/O One Serials, One Parallel, One Keyboard
Dos & GW Basic 4.01	Dos & GW Basic 4.01	Dos & GW Basic 3.3	Dos & GW Basic 3.3
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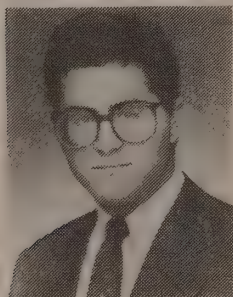
Graphics' Personal Iris, Compaq's Systempro file server and LTE notebook computer, and the even smaller Poqet PC.

As the RISC market heats up, LSI's in the enviable position of manufacturing CPUs and complex chip sets for both current standards, MIPS (used in the SGI workstations) and SPARC. LSI's proprietary technology and pioneering work in gate arrays enables it to design its products relatively quickly and inexpensively—company executives recently stated that whereas Intel's 80486 took a hundred engineers and three years to design, LSI was able to create a fast RISC CPU in a year's time with six engineers.

Michael S. Dell

Chairman and CEO
Dell Computer

The former dorm room-based clone business is now a large multinational vendor of high-quality PC compatible hardware in all price ranges. Historically it's been a mail-order-only operation, and Dell has scrambled to create an infrastructure that would help his company and his customers avoid the traditional pitfalls of that approach, notably with excellent support and a nationwide service agreement



with Xerox.

Last year, however, Austin-based Dell Computer made its first venture into the retail channel, with Dallas-based Soft Warehouse picking up the exclusive distribution deal. With Soft

Warehouse making its first inroads into California, customers will soon have the instant gratification of taking a Dell computer home right away.

John C. Dvorak

Columnist

Not content with having different columns in more magazines than he can count, Dvorak has now moved into the book world with a series of Dvorak's Guides from Osborne/McGraw-Hill. The first in the series, *Dvorak's Guide to PC Telecommunications*, has not only entrenched itself as a standard reference since it came out early in 1990, it's been credited with a marked increase in traffic on some of the systems it discusses.

Esther Dyson

Editor and Publisher
Release 1.0

At \$495 per year, *Release 1.0* is perhaps one of the industry's pricier publications. It is also one of the most solid and informative, offering serious analysis of industry trends and developing technology with a healthy imperviousness to hype.

Dyson hosted the first East-West Technology Conference in Budapest, which brought together entrepreneurs, vendors and experts to discuss the opportunities and pitfalls of doing business in the Eastern Bloc.

Larry Ellison

President, CEO, Chairman of the Board
Oracle Corp.

The law of gravity finally caught up with database titan Oracle in 1990, as it posted its usual doubled revenues for fiscal 1990 and followed with extensive and first-ever losses for the first quarter of fiscal 1991. Massive turbulence ensued, with Ellison significantly reconfiguring the company and promising a return to prosperity in the second quarter. Results January 2 showed the company restored to profitability.

Gordon Eubanks

President and CEO
Symantec Corp.

Having built Symantec into a leading vendor of utilities, applications, and programming tools, Eubanks performed a significant feat of growth-by-acquisition by acquiring Peter Norton Computing—at a time when Norton was just bringing to market its versions of the ever-popular Norton Utilities for UNIX and Mac. This move puts Symantec at a significant advantage for good performance in multi-vendor markets.

Royal Farros

Chairman of the Board
Executive Vice President
T/Maker Company

Farros came up with one of the year's brightest marketing ideas, one that's sure to help smaller companies with good products reach their markets: The SmartBundle. On the premise that first-time Mac buyers might like an all-in-one software option other than Microsoft Works, he put together a package of MacUser Editor's Choice winners. For a mere \$349 list, the customer gets full-featured standard versions of WriteNow 2.2, Full Impact 1.1, SuperPaint 2.0, and RecordHolderPlus 3.1—all products of different vendors. We hope this sort of alliance becomes commonplace.

Cliff Figallo

Director
The WELL

Imagine, if you will, an online universe populated by some of the most outspoken and opinionated people you're likely to encounter, talking about subjects ranging from current events to software design to music to utopia configuration. Imagine networking on a global scale. Imagine incendiary argument on a global scale, and mutual assistance on a global scale. Imagine all this happening on hardware that consistently wonders how it got into this and behaves accordingly.

Cliff is the guy who holds all this together with common sense and a diplomacy that would serve him well at the UN, and he did heroic service in 1990 as the Starship WELL continued its voyage into worlds that haven't been imagined yet.

Stephen J. Friedman

President
Software Entrepreneurs' Forum

SEF has grown considerably in the last year, broadening its activities as a resource for startups and a catalyst for putting companies together and bringing products to market. Former SEF president Ed Niehaus credits Friedman with much of this im-

provement in an already-effective organization.

SEF aside, Friedman's active on a number of other fronts. He's vice president of Software Partners, Inc., which develops and publishes TimeSheet Professional, the preferred time-and-expense tracker for accounting firms and the Fortune 500. He also founded Novotrade, a Budapest-based developer of entertainment and animation software, and was a co-founder of the Computer Game Developer's Conference.

John Fry, David Fry, Randy Fry

Kathryn Kolder

Fry's Electronics

Can anything stop these guys? They opened another huge store in Palo Alto and show no signs of slowing down. And if they're worried about the incursions of Soft Warehouse into their Silicon Valley turf, they're not letting on...

David Fulton

President and Co-Founder
Fox Software

Long a leader in the world of dBASE-compatible products and enhancements, Fox continued to add value to its products and to erode Ashton-Tate's market share in both the Mac and PC worlds during 1990.

Which wasn't nearly as dramatic as the outcome of Fox's long-running suit with Ashton-Tate, in which the dBASE vendor was alleging copyright violation on Fox's part. The suit was closely watched by the entire x-base (dBASE-compatible) community, to which the judgment that A-T does not own the copyright on dBASE is likely to be a major windfall.

Dr. James Gardner

Psychologist

Fairview Developmental Center

Along with programmer Anne Breuer, who suggested him for this list, Gardner has developed a computer-based diagnostic system to help physicians and mental-health professionals ascertain the nature of a patient's problem in difficult situations, using artificial intelligence techniques. Gardner's systems are in use worldwide and he is a renowned expert in his field. He's currently working with Breuer's Planet Press, with support from Fairview in Costa Mesa, to enhance and develop the system for use at other mental health facilities.

Charles Garvin

Founder

Personics

Running on a UNIX system in a back room around the corner from NeXT in Redwood City is one of the most innovative and useful implementations of computer technology we've seen yet.

Not unlike the Software Publishers Association with its increasingly hawkish campaigns against software piracy, the music recording industry has long decried the lost revenue caused by home taping, and sought to prevent it with tactics ranging from copy protection on DAT machines to attempts to put surcharges on blank tape. None of which did a thing to address the obvious fact that people seemed to want

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flexible, customizable music, and were prepared to go to a fair amount of trouble to get it.

So Garvin came up with the idea for The Personics System, which is currently installed in 250 record stores nationwide and offers over five thousand titles (on CD) at \$1.10 per track. The customer can preview selections, then put together a custom tape up to ninety minutes long by using a jukebox-like interface. Artists, record companies, retailers and Personics all get paid, and the convenience and quality are a substantial improvement over making your own scratchy tapes at home.

Initially Personics encountered resistance from major record labels, who saw the system as a threat to their sales. However, independent labels have found it a promotional godsend, and as studies show that Personics-featured artists sell significantly more prerecorded product at stores with Personics systems, the majors are making more material available.

We think Personics deserves recognition as a creative solution to an ongoing problem. We also think that it deserves serious study as a distribution approach for other digitized information. Online systems, say. Or software.

Jean-Louis Gassée

Founder
Be Labs

The usually flamboyant Gassée showed a lot of grace under pressure during his attenuated departure from Apple, remaining close-mouthed about his future plans and deflecting blatant invitations to bad-mouth the company. He's subsequently turned up on the board of directors of CD-ROM leader Meridian Data, and announced the formation of Be—while declining to drop any tantalizing hints as to what Be might be up to. Given Gassée's rare combination of vision and practicality, though, it ought to be interesting to watch.

Bill Gates

Chairman
Microsoft

There's hardly anything left to add about the triumph of Windows 3 and its profound impact on the PC marketplace, but readers wanted to make sure we didn't forget to put Gates on this list. Gates is one of those rare CEOs who, besides leading a huge company into seemingly limitless prosperity, manages to give his colossal customer base a sense of an accessible human behind the products.

The jury's still out on OS/2, but Microsoft is hardly standing still. Rumors out of Redmond suggest wondrous multimedia in the works, as well as operating system software for the new breed of pen-input computers.

Fred Gibbons

President and CEO



Software Publishing Corporation

It was a good year for SPC, with increased revenues and a new version of Harvard Graphics, the leading business graphics package for PCs. SPC also made a

smart strategic move with a technology licensing agreement with Samna. Samna's Ami word processor for Windows, regarded by many critics as the best available for that environment, will be the foundation of an enhanced document processor, slated for 1991 release, that should help consolidate SPC's strong position in the office marketplace.

Steven M. Gibson

President and Founder
Gibson Research Corporation

Gibson's weekly TechTalk column in *InfoWorld* is a valuable source of information to the microcomputer world and has a devoted following. What really has a devoted following, though, is his company's SpinRite II (currently in version 1.1), a hard disk utility program which users and critics alike seem to think is the best thing since the hard disk itself.

Emmanuel Goldstein

Editor-In-Chief
2600

Whether you're a computer security professional or somebody trying to circumvent computer security professionals, this "hacker quarterly" is a unique information resource. Its editorial content tends to run heavily toward reader-submitted treatises on subjects like "Converting a Tone Dialer into a Red Box", and its authors frequently sport names like The Plague and Mr. Upsetter. You'll also find interviews with corporate security experts in the pages of 2600, and extended behind-the-scenes reporting on some of the more celebrated computer crime cases of the

day. Goldstein's mag is, in a sense, the hometown newspaper of cyberspace, and it's a great source of technical information, offering a perspective you probably won't see anywhere else.

Harry Goodman

Radio Host

Reader Kenn Fong of Oakland recommends Goodman to the attention of *MicroTimes* for Goodman's radio talk show on computer-related subjects. Says Fong, "Harry's hour-long weekly radio program, 'Your Expanding Infosphere,' on KALW-FM (91.7 San Francisco) provides a wide variety of information on computers and the way they affect our lives. Harry gives both Mac and PC news, advice, and reviews, and he tries to make everything understandable to both the beginner and advanced user."

Albert Marc Gouyet

Vice President of Engineering
Neuron Data

Calisa Cole of Palo Alto recommends Gouyet to our attention as the chief architect of NEXPERT OBJECT, a package that brings sophisticated artificial intelligence capabilities to the PC environment—as well as OS/2, Macintosh, VMS, UNIX and mainframes.

Says Cole, "Through Gouyet's programming efforts and vision, NEXPERT OBJECT was running successfully under Microsoft Windows 3.0 when that product was launched earlier this year. As Gouyet continues to write code and advance NEXPERT technology, he also manages a growing team of engineers, and oversees code development on over thirty

WHO'S IN/WHO'S OUT

Over half the people on this year's list weren't on last year's. And of that number, quite a few have never appeared on the list at all. Whatever else may have been going on in 1990, stagnation wasn't a big problem.

To some extent, this reflects the fact that our readers were especially enthusiastic about sending us nominations for the list this year, and we hope this trend continues.

Beyond that, however, it's hard to chart any predominant trend in this year's 100. In terms of machine type, operating systems, and the like, there are no big changes from last year. Similarly, there are eight women on this year's list compared to seven on last year's, not a big difference.

Several prominent people on last year's list aren't on this year's, for a variety of reasons. Businessland chief David Norman, for instance, was having serious troubles as the systems-integration pioneer floundered in changing markets. Silicon Beach's Charlie Jackson sold his company to Aldus early in the year and has been doing a lot of behind-the-scenes work since; we expect to be hearing a lot more from him in the future, but he was low-profile in 1990.

Nobody from IBM is on the list; with the possible exception of its RISC workstations, it was a pretty lackluster year for Big Blue, whose market share continues to be eroded by Compaq et al.

Our Man of the Year, Gil Hyatt, is an unusually fine example of the ability of relative unknowns to effect change and attain sudden prominence, but there are others.

For example, astronomer Cliff Stoll, whose unlikely adventures stalking the Wily Hacker led to one of the most engaging and illuminating discussions of computer security yet.

Or Atari's Don Thomas, who markets Portfolios by day and leads an ST users' revolution by night.

In the Meteoric Rise Department, we've got Apple's Michael Spindler, who came up through the company's European operations and weathered the Cupertino Coups to emerge as president.

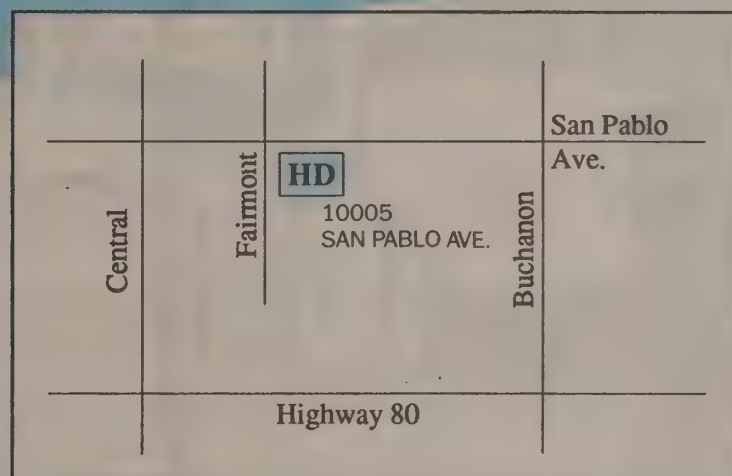
Virtual Reality will probably be to 1990 what multimedia was to 1989, and probably its most visible pioneer was VPL's Jaron Lanier. We suspect that, as with multimedia, many of the concepts now considered VR will be standard features of the computing environments (and even consumer electronics environments) of the future, and that work done at VPL, Autodesk, Sense8, and elsewhere will have a profound impact. Whether the hype will die down before or after product gets to market, or whether anybody will use the term "virtual reality" in describing said product, is, of course, a matter of speculation.

Continued on page 95

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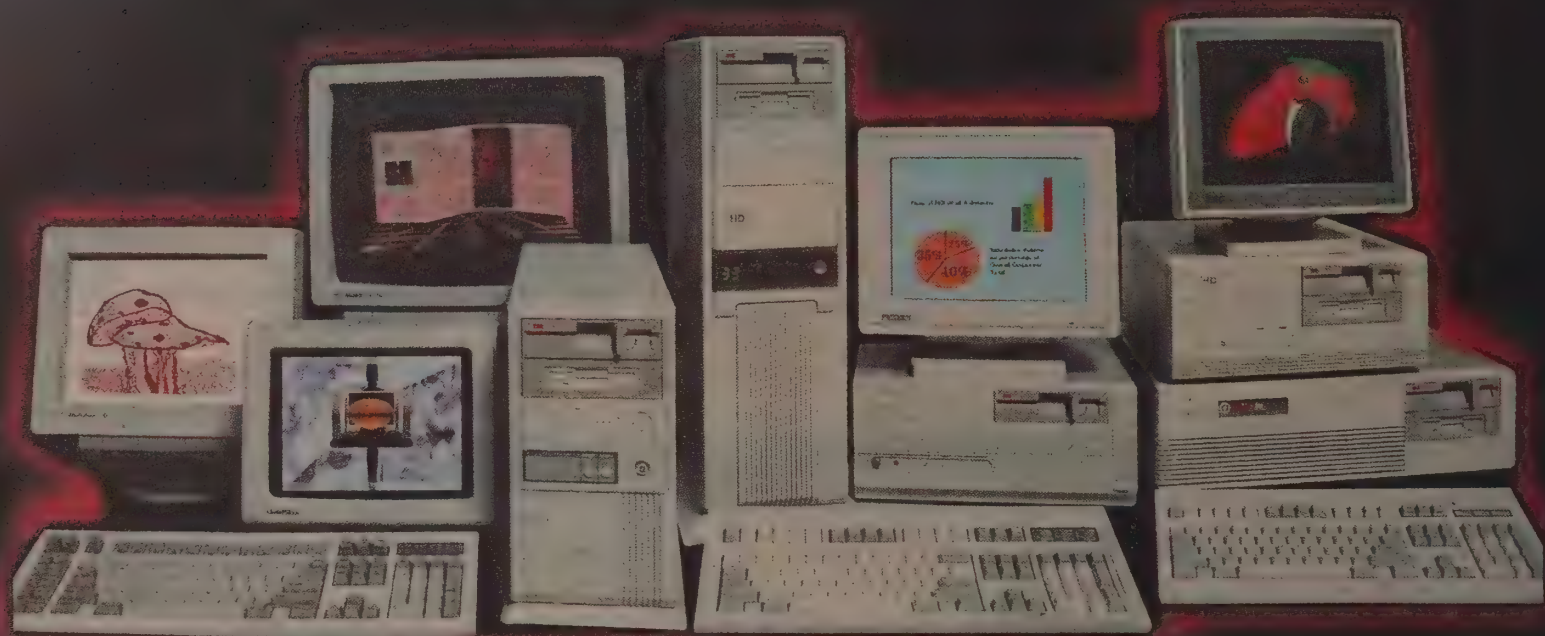
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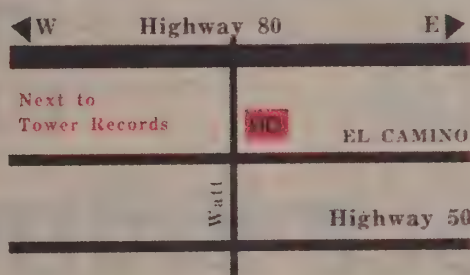
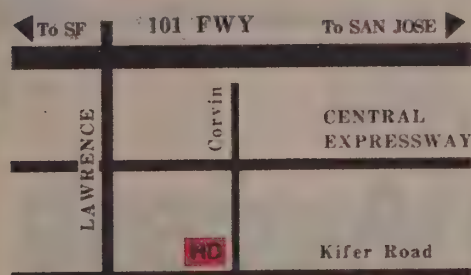
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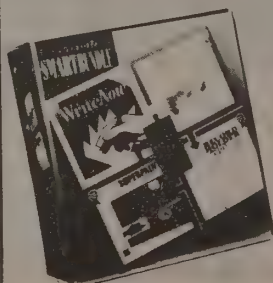
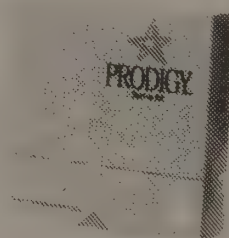
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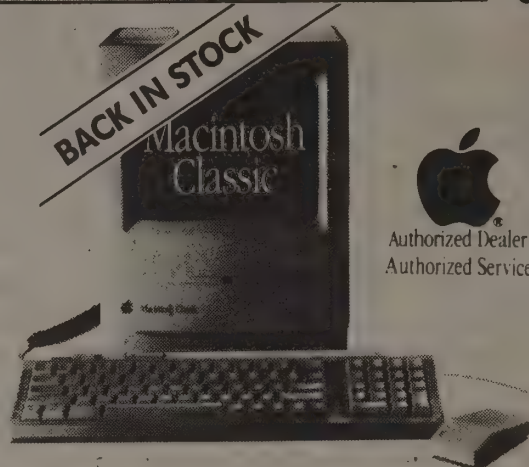


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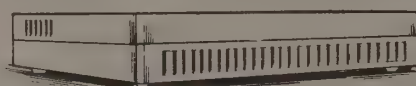
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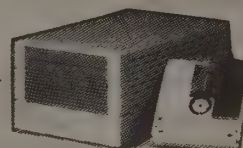


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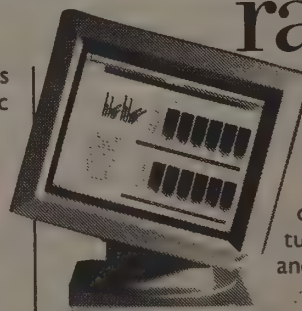
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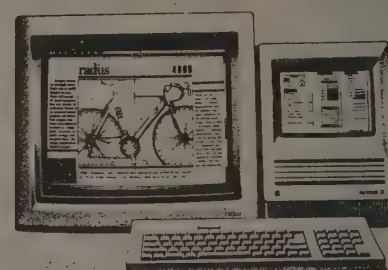
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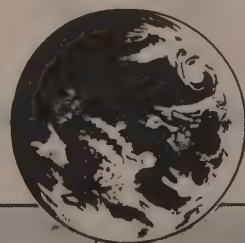
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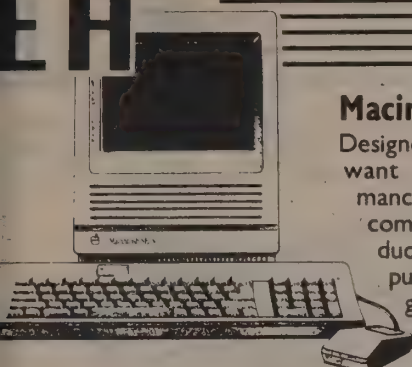
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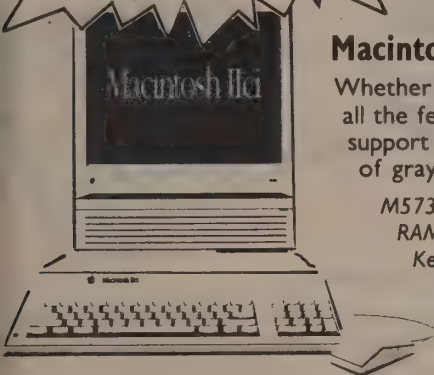


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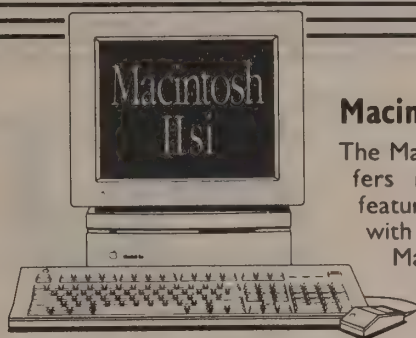
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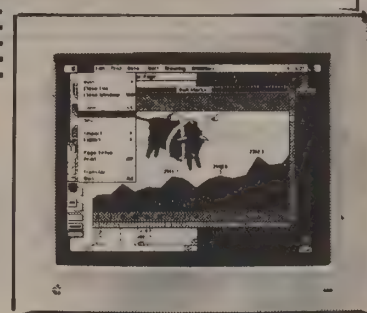
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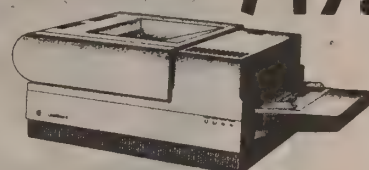
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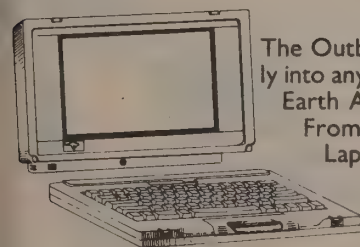
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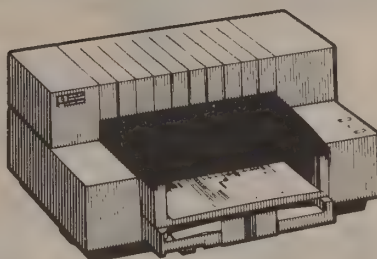
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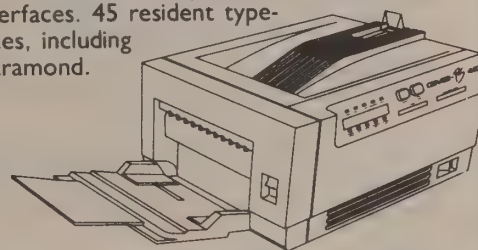
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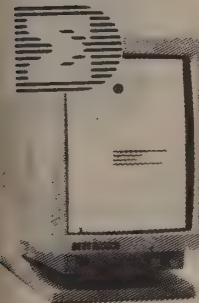
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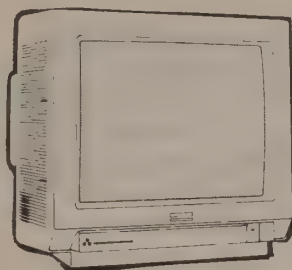
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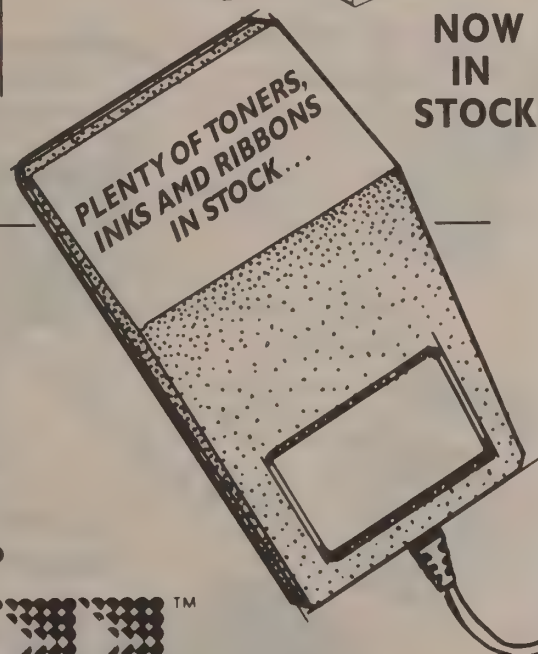


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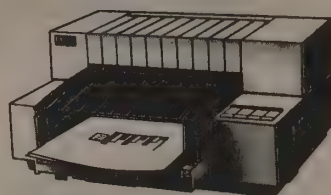
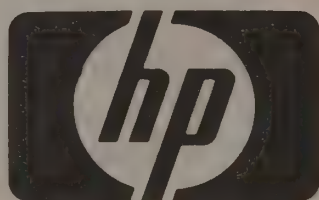
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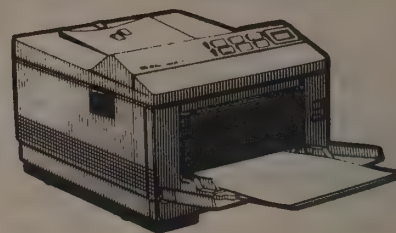
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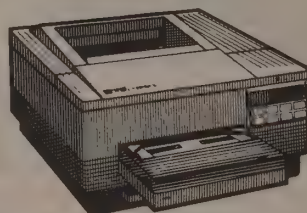
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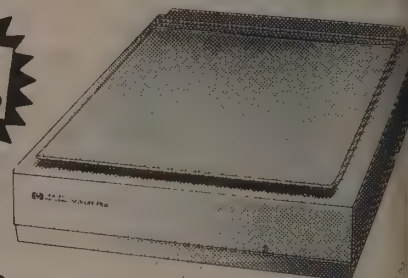
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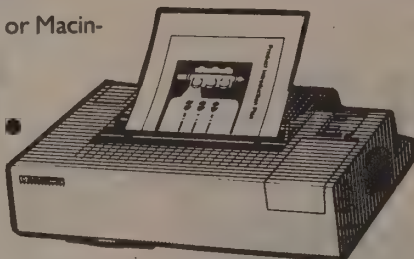
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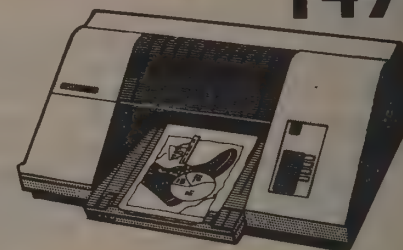
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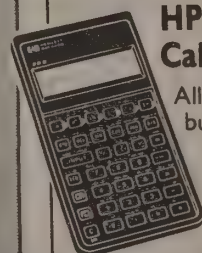
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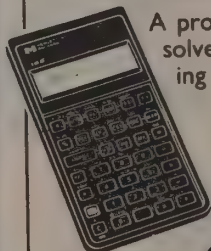
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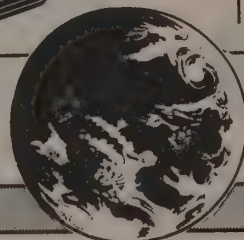
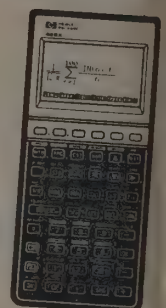
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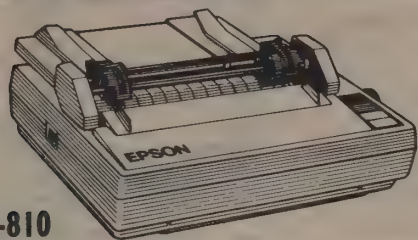
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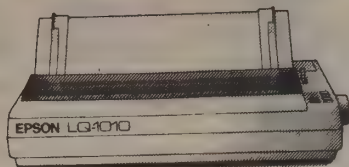
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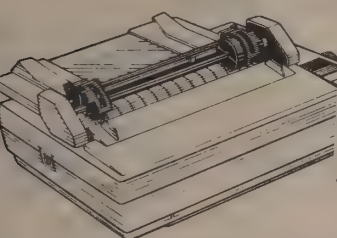
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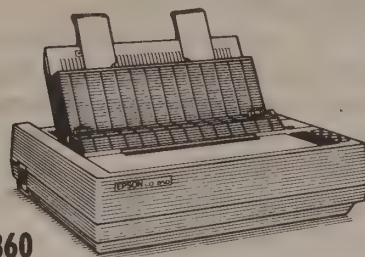


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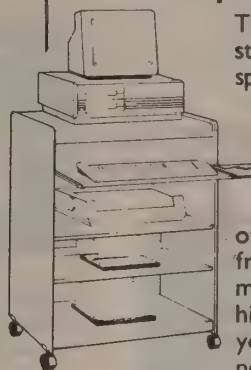


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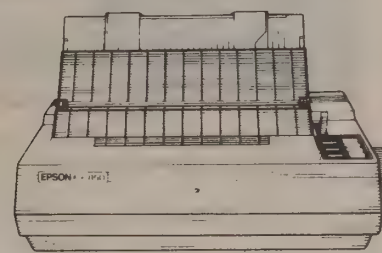
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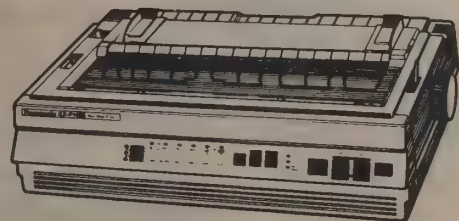


FX-850

- 9 pin dot matrix • 264 draft 54 NLQ • Push tractor paper park for single sheet feed.

369.

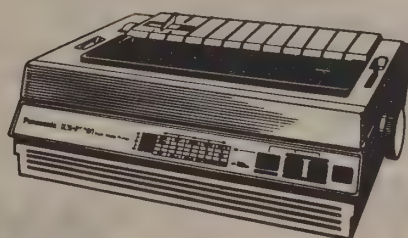
Panasonic Office Automation OA



KXP-1695

- 9 pin • EZ set control panel • 330 cps draft • 66 cps NLQ • 8 resident fonts • 16.5" wide carriage • Push/pull tractor
- rear, bottom and front paper feed.

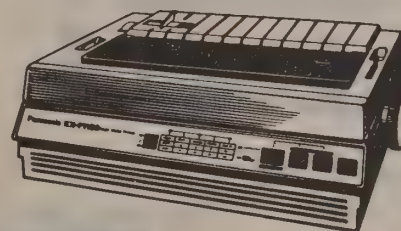
395.



KXP-1191

- 9 pin • EZ set control panel • 240 cps draft • 48 cps NLQ • 6 resident fonts • Push/pull tractor.

259.



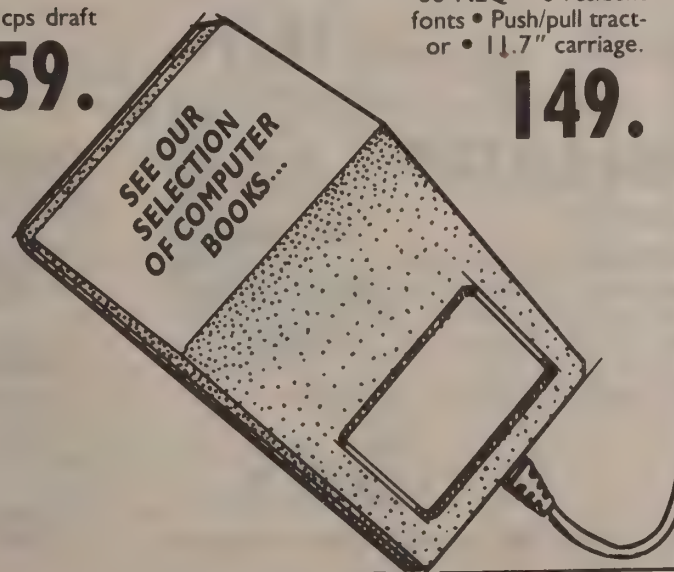
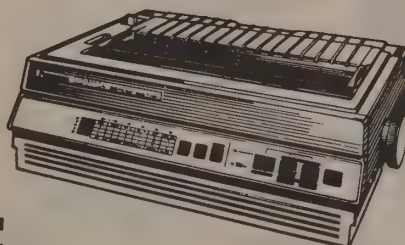
KXP-1180

- 9 pin • EZ set control panel • 192 cps draft • 38 NLQ • 6 resident fonts • Push/pull tractor • 11.7" carriage.

149.

KXP-1124

- 24 pin • EZ set control panel • 192 cps draft • 63 cps NLQ • 7 resident fonts • 11.7" wide carriage • Push/pull tractor • 360 x 360 dpi graphics.



AVAILABLE

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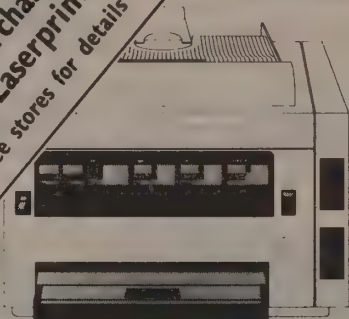


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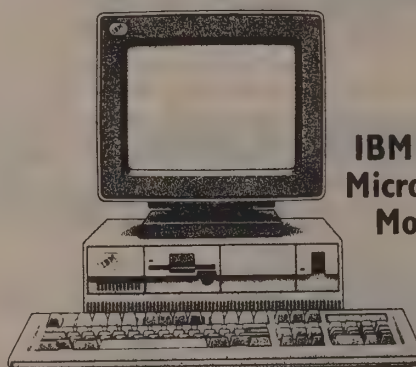
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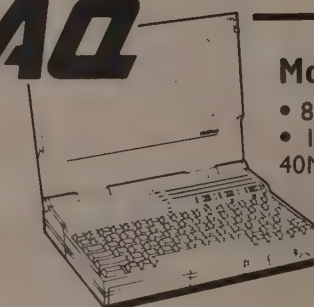
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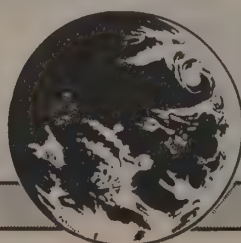
LTE/286
Model 20

2595.

LTE
Model 20

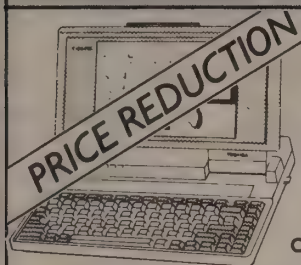
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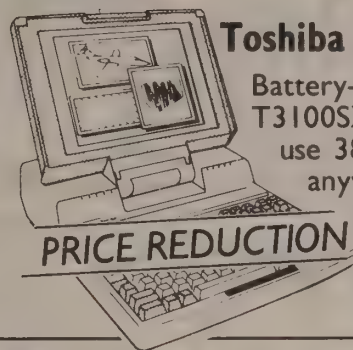
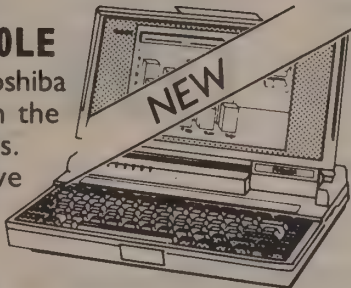
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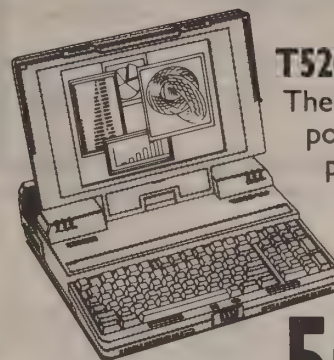
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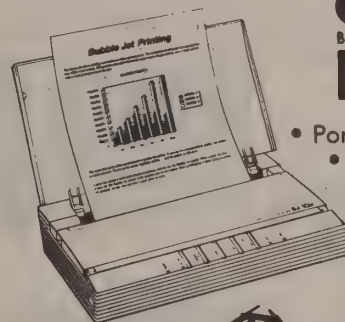
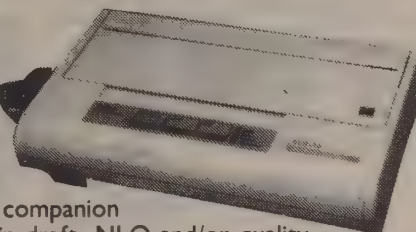
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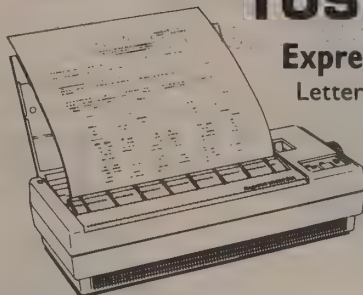
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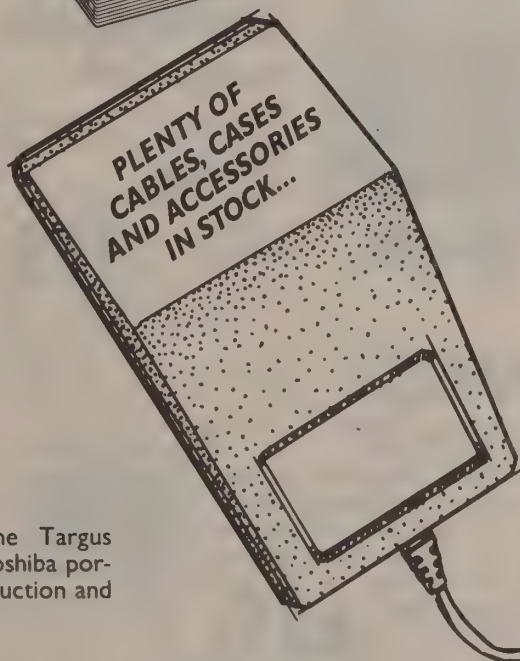
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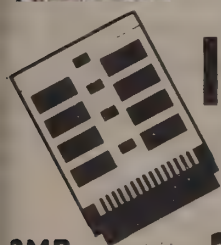


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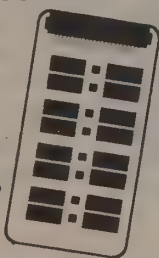
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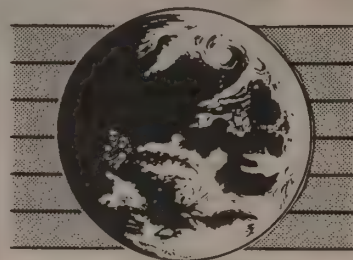
369.



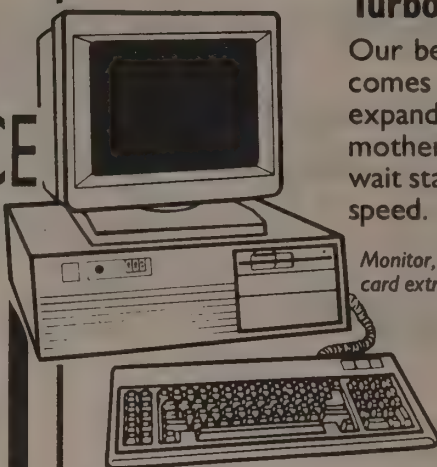
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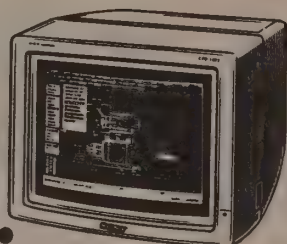
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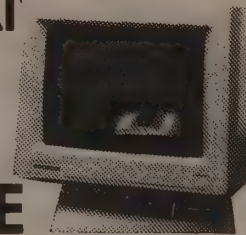


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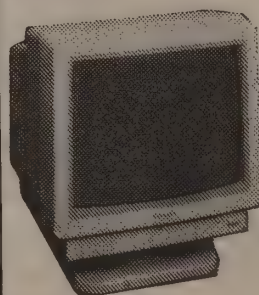
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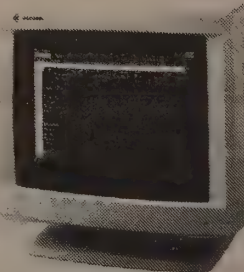
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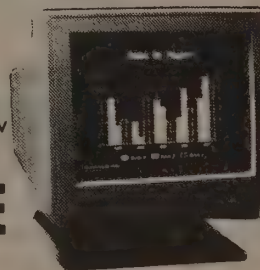


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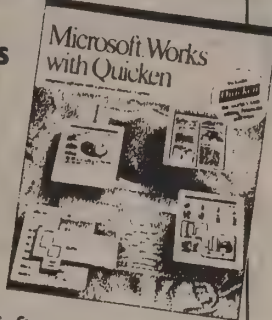
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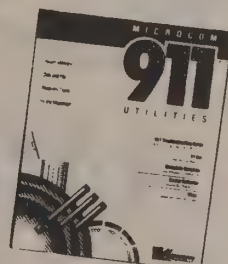
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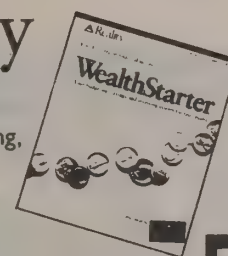
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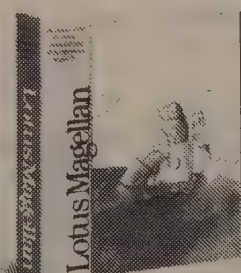
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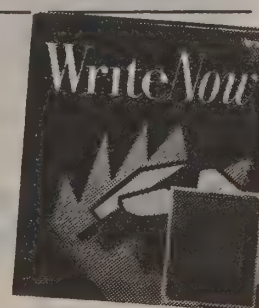
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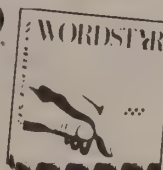
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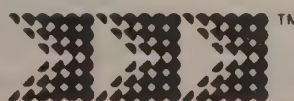
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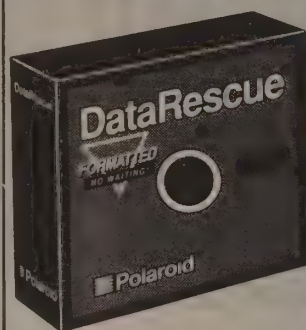
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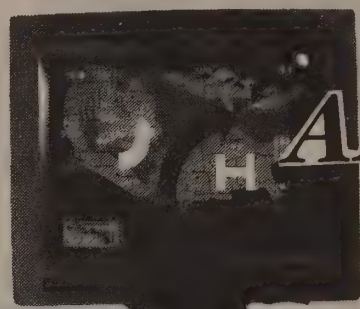


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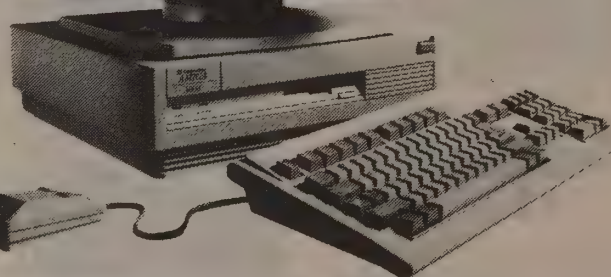


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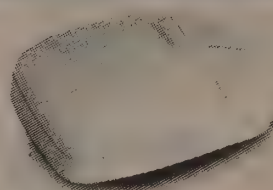
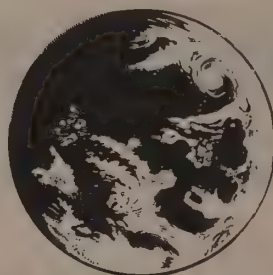
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Autodesk

It was another banner year for Autodesk, with Release 11 of AutoCAD shipping to hordes of eager users, and slick 3D modeling software coming to market—to say nothing of the usual healthy, growing revenues. Meanwhile, out on the cutting edge, Autodesk's Cyberspace project suggests that the company that prides itself on building tools for the golden age of engineering will continue to bring innovative, and occasionally unheard-of, ideas to fruition for some time to come.

Richard Hackborn

Vice President
Computer Products Organization
Hewlett-Packard

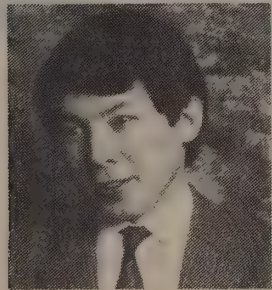
While Hewlett-Packard appears to be struggling to redefine itself to compete in radically changing markets, the media-shy Hackborn has spent several years transforming its peripherals division into the clear leader in the printer market. Besides being the most commercially successful product in HP's long history, the LaserJet series is a perennial favorite among users and critics alike. At year's end, Hackborn was given the new task of overseeing the company's lagging personal computer operations, which may yet result in a turnaround in the Vectra's fortunes.

George Hara

Managing Director
DEFTA Inc.

At a time when Japan-bashing is popular in the US (and US-bashing is not entirely unknown in Japan), venture capitalist Hara is trying to turn the tide by im-

PHOTO: MICHAEL JAY



plementing his concept of the multinational high-tech startup and actively seeking to create mutually beneficial relationships between US and Japanese companies. He pioneered the Alliance conferences to bring together such com-

panies, and the conferences have resulted in a number of agreements.

Terry J. Hatter

Judge, US District Court (Los Angeles)

As we were going to press, Hatter, presiding over the lawsuit between Fox Software and Ashton-Tate, the latter of which has historically taken a hawkish approach to defending the dBASE code against all comers, dropped the judicial bombshell of the year, announcing that because dBASE was based substantially on a public-domain language called JPLDIS,

Ashton-Tate did not, in fact, own the copyright on its flagship product. The decision sent shock waves through the software community, and as we went to press its implications were being debated with some passion. What is certain is that key areas of the database business will never be the same again; there was also some discussion as to the possible bearing of the case on the Lotus/Borland look-and-feel suit, among others.

Jeff Hawkins

Director of Advanced Systems
GRiD Systems Corporation

Handwriting-input computers are seen as one of the major technological breakthroughs of the '90s, and are certainly the focus of intense R&D efforts now. Aside from the Sony Palmtop, currently available only in Japan, the pioneering product using this technology is GRiD's GRiDPAD, a PC-compatible, 4.5 lb. clipboard-sized computer that accepts both handwritten and keyboard input as needed.

While the GRiDPAD's success in various target markets results from the efforts of many individuals and companies, Hawkins was the author of the handwriting algorithm used in the machine, and he's one of the key players in the development of this technology.

Trip Hawkins

President and CEO
Electronic Arts

At a time when many entertainment-software houses are struggling and the SPA reports a declining market, Hawkins has led his company to become a stock-market darling by refusing to become a stationary target. Wise decisions to get involved in the Nintendo and 16-bit Sega Genesis markets have both diversified the company's operations and led to significant revenue growth.

Not that EA's been neglecting its traditional market in entertainment software for computers, of which, according to market analysts Alex. Brown & Sons, it owns about 30%. A particular favorite in 1990 was the Populous series, which let gamers become deities in their own little worlds.

Rick Hines

Programmer
Central Point Software

We heard about Hines from reader Holden Aust, who says, "Rick is one of Central Point's top programmers, and is largely responsible for the architecture and interface which has made PC Tools by far the best-selling utility in the industry."

Mark Hoffman

President
Sybase

Though the company is still relatively low-profile and still privately owned, its database software is a key component in the strategies of many vendors seeking to dominate the corporate markets of the '90s—both UNIX vendors seeking to broaden their markets and PC vendors seeking to expand into large-computer and multivendor arenas. A key development during 1990 was the announcement of a multifaceted agreement with Lotus (which owns a minor interest in the

company) under which Sybase would market 1-2-3 along with its SQL Server product in UNIX and VMS markets, extending the industry-standard interface to large-computer environments.

David House

President
Microcomputer Components Group
Intel Corp.

Regarded by many observers as the heir apparent to CEO Andrew Grove, House is one of the prime movers in Intel's cutting-edge chip design. In addition to championing the DVI video compression standard, seen as a key component to Intel's multimedia strategy, he's overseen the evolution of the 386 and 486 chip families—most recently a 100MHz 486 chip, announced at year-end—a formidable answer to Intel's scrappy smaller competitors, bringing blindingly fast RISC chips to market.

Dave Hughes

Operating Officer
Old Colorado City Communications

Once again the tireless telecomm populist has been working to bring the miracle of electronic communication not just to an elite but to everybody—in small towns, Indian reservations, schools, etc. Most recently he's been in Washington at Office of Technology Assessment meetings, currently the site of discussions between government and private-sector agencies to build a nationwide communications network.

Hughes, the creator of the "highways of the mind" concept, was there to advocate the notion that if the taxpayers' money was going to be spent on building such a resource, it should benefit all citizens. Specifically, that it was both proper and necessary to the country's future that such a network be accessible, not merely to postdoctoral researchers needing to run simulations on Crays, but K-12 students who needed to do research—in the Library of Congress. From Nebraska.

Steve Hui

President and CEO
Everex Systems Inc.

For the last few years, Everex has been striving to distinguish itself from the faceless mass of clone dealers and establish a strong position for itself as a vendor of name-brand PC compatible systems. In an era of high-tech Darwinism, Hui's emphasis on long-term strategy and solid planning rather than short-term gain seems to be paying off.

According to Everex's 1990 Annual Report, "Every research and development engineer at Everex works under this mandate direct from President Steve Hui: Be excessive. Starting with the design engineers, everyone who touches the product is motivated to create a long-term profit producer for Everex, rather than to get something adequate put together and off his or her desk in time to meet a deadline. Our excessiveness in the engineering lab makes possible zero-response-time manufacturing and 48-hour order fulfillment in the distribution network, where high-speed operations give us a powerful advantage in the marketplace."

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- Socket for 80387
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- 230 W Power Supply
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

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386-25 MHz

- Landmark=36.7
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- Shadow RAM, Page Interleaved Memory
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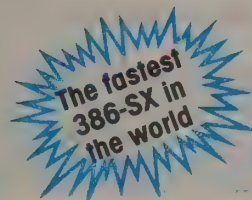
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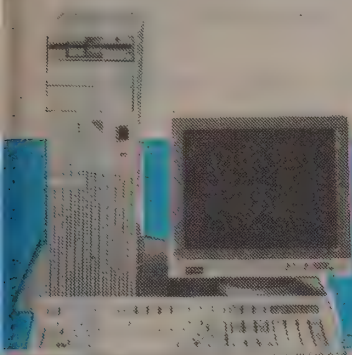
386-SX 16 MHz

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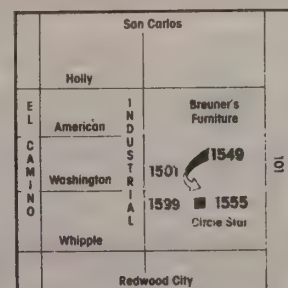
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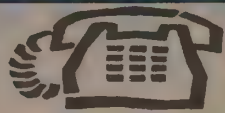
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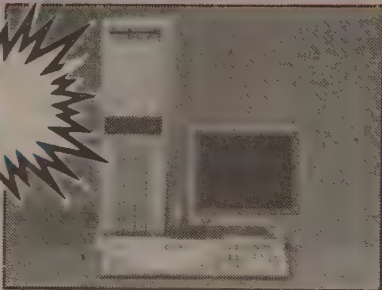
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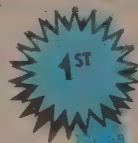
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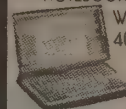
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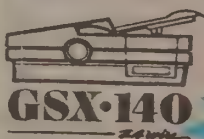
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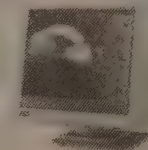
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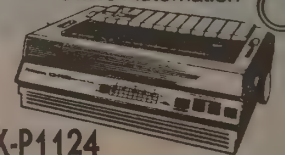
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At a time where venture funding seemed to be drying up around the industry, this brand-new partnership of a veteran venture capitalist and successful software entrepreneur succeeded not only in attracting investments but in carving out a distinctive niche for itself—software only. In less than a year, it's put together an impressive portfolio of companies, including Central Point and T/Maker as well as a startup called Slate. About which we'll be hearing more soon.

Steven P. Jobs

President and CEO NeXT Inc.

Just when most observers were ready to write NeXT off, citing disappointing sales, development delays, closing windows of opportunity, and all manner of perfectly real problems, Jobs confounded the skeptics by unveiling a whole new family of hardware with unmatched graphics features and an impressive array of mainstream applications (in, of course, state-of-the-art versions). Not to mention alliances and connectivity agreements with IBM, which implemented the NeXT interface on its new RISC workstations.

By the end of the year NeXT was shipping at least limited quantities of the new machines, based on Motorola's hard-to-get 68040 processor. And although it's too soon yet to determine the ultimate fate of the Black Box, its future looks a lot brighter than it did a year ago.

Reese Jones

President and Founder Farallon Computing

Having taken Farallon from BMUG spinoff to the position of Mac network frontrunner and the most visible high-tech company in Emeryville, Jones managed a major coup at year's end. Farallon entered

into an agreement with Apple to become the official vendor and support source for AppleTalk networks in the PC environment, in order to facilitate the development of mixed-platform networks.

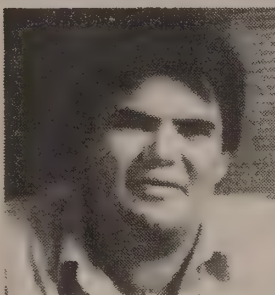
As befits a company specializing in connections, Farallon also set a sterling example for the industry by choosing to offer low-cost licensing agreements to vendors who'd

been cloning Farallon's PhoneNet products, rather than taking the matter to court. So far the arrangement seems to be mutually beneficial.

Philippe Kahn

Chairman, President and CEO Borland International

From time to time, skeptics have wondered about the flamboyant Frenchman's ability to take Borland from garage vendor of programming languages to a major force in the software world, but they've been pretty quiet lately. Borland's spreadsheet Quattro Pro has enjoyed record sales, the Turbo program-



ming tools series continues at the cutting edge, and Paradox, its relational database, grabbed market share to become, according to Computer Intelligence, the best-selling relational database on the

PC platform. Quattro also attracted the attention of Lotus Legal because it allows the user to configure a 1-2-3-like interface, and while the situation will probably take some time to make its way through the courts, Lotus appears to have taken on a formidable opponent.

Y.H. Kim

President and CEO Hyundai Electronics America

Hyundai is a relative newcomer to the US marketplace with its line of PC compatible computers, but the company's obviously planning to stay. In November it announced the opening of an R&D center in San Jose to supplement the activities of its R&D facilities in Korea. Said Kim, announcing the appointment of R&D VP Hoon Choo to head the facility, "We have wanted to do this for some time, as our product development and marketing decisions need to be strongly linked to the needs of the US marketplace." The appointment of Choo, a senior key executive from Korea, to the post indicates that the parent company regards the facility as a key component of its international operations.

Helmut Kobler

Author

Today's college campus offers its students an unprecedented range of powerful computer-based tools and access to information. Today's college students, however, are often completely uninformed about the mere existence of these tools, let alone about how to use them, particularly if they're not actually registered in the computer science department. Kobler, a former *MicroTimes* columnist, current contributing editor of *Publish!*, and hard-working undergraduate at UC Berkeley, decided to address this problem. The result is *Campus Computing*, an engaging guide to subjects ranging from buying your first system to electronic research to computer-based job-search opportunities.

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VPL Research

Virtual Reality wizard Lanier was much in the press (from *Scientific American* to *Rolling Stone*) this year, popularizing the concept of computer-generated worlds to audiences quite outside the realm of NASA, where a good deal of this technology developed. Lanier's company has pioneered VR, running ever-more-complex interactive simulations on ever-more-powerful Silicon Graphics machines. The results of VPL's high-end experiments are rapidly trickling down to the level of mere mortals, though it's probably premature to expect the Enterprise's holodeck on your Macintosh just yet.

Gene Lu

Chairman, President, CEO
Advanced Logic Research

As the EISA standard pioneered by Compaq grows and prospers and generally erodes IBM's market share, one of its most successful proponents is ALR, whose BusinessVEISA product line has been very well received. The company doubled its previous year's earnings in 1990, and, with products incorporating EISA, ISA and MCA and supporting DOS, UNIX, and OS/2, it's well positioned to take advantage of market trends in the next decade.

William Lyons

President and COO
Ashton-Tate

Well, if anybody deserves a Heroic Grace Under Pressure During 1990 award, it's Lyons. He assumed his current responsibilities in April, replacing departed

chairman Ed Esber, and inherited a company in disarray after several money-losing quarters. His approach to managing the company has focused on addressing key problems, most notably the completion of the long-delayed dBASE IV 1.1, which finally started shipping in the fall.

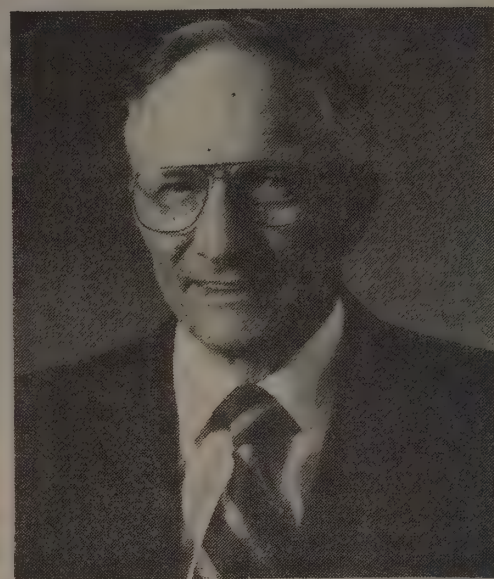
Lyons had just succeeded in returning the company to some degree of profitability when the judicial bombshell of the year fell. Judge Terry Hatter, presiding over a long-running dispute between Ashton-Tate and Fox Software, announced that in fact Ashton-Tate did not own the copyright on dBASE. As we went to press, Ashton-Tate was in the process of appealing the ruling, the practical implications of which are being ferociously debated. One thing that's pretty clear is that Lyons has his work cut out for him in 1991 if Ashton-Tate is to survive in any meaningful form.

Jim P. Manzi

President and CEO
Lotus Development Corp.

What with look-and-feel lawsuits and such, Manzi is certainly no stranger to controversy. He also gets the award for Weirdest Speech Given At A Press Event In 1990 for his NeXT rollout dissertation on how Lotus had created the new spreadsheet Improv "because God wanted us to."

Nonetheless, Manzi has done a formidable job of dealing with the challenges facing a gigantic but fundamentally single-product company. He set up technology agreements to strengthen Lotus's position in the UNIX arena, with versions of 1-2-3 due for most



ROBERT NOYCE

The computer world suffered a great loss upon the death of pioneer Robert Noyce on June 3. Noyce, 62, co-invented the integrated circuit, and most recently was Chairman of Sematech, a consortium charged with returning the US to preeminence in the semiconductor industry.

Noyce was perhaps best known as one of the founders of Intel, with which he remained involved until his death; previously, he had also co-founded Fairchild. His integrity and commitment to technical excellence were known throughout the industry, and he will be sorely missed.

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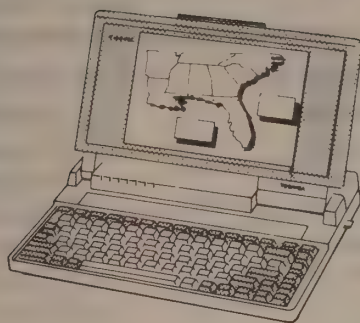
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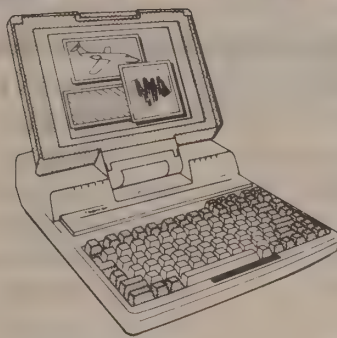
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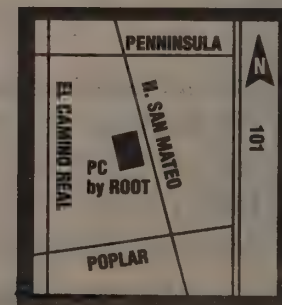
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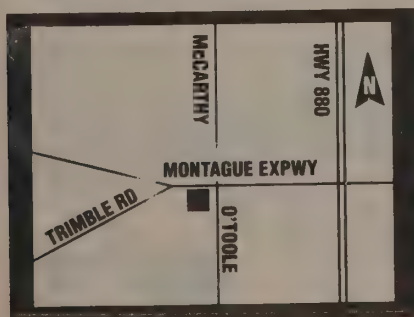
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significant hardware platforms in the corporate world. In addition, he's pushed not only the development of Improv, the NeXT-generation spreadsheet, but a range of products from Notes to Magellan. As part of that effort, Lotus introduced what promises to be the most controversial product of 1991, Lotus Marketplace, a CD-ROM database that has the direct mail industry brandishing checkbooks and privacy-concerned consumers threatening class action suits. Should be interesting to see what happens.

Scott McNealy

President and CEO
Sun Microsystems

Generally speaking, McNealy seems to be having a great time distinguishing himself as a purveyor of irreverent common sense in the industry. 1990 saw a serious attack on the business market with low-cost RISC-based SPARCstations, connectivity with everything from Mac to Hewlett-Packard, and alliances with leading PC software vendors, including Lotus. Naysayers still maintain that UNIX isn't quite ready for prime time, but Sun and SPARC seem intent on proving otherwise.

Larry Michels

Co-Founder and President

Doug Michels

Co-Founder and Executive Vice President
The Santa Cruz Operation

Aside from a still-unresolved spot of look-and-feel bother with Lotus, SCO had a banner year, its found-

ers continuing to push the strategic alliances and software excellence that have made the company the UNIX supplier of choice for Intel-based machines. The company's SCO UNIX, the first version of the operating system to be called UNIX rather than XENIX, was shipped, giving 386 users one less reason to go for OS/2.

Chuck Moore

Computer Cowboys

The author of the Forth programming language is back with a new technological breakthrough. Says reader and longtime Forth enthusiast Jack Woehr, "Chuck is now a chip designer, about to release a 50MHz 32-bit microprocessor that will retail for \$20. He designed it with tools he wrote himself that run on the 16-bit chip he designed, graphically laying out the silicon with a three-key keypad only."

Nathan Morton

President and CEO
Soft Warehouse

A retail veteran with years of experience in companies from Two Guys to Home Depot, Morton took over Soft Warehouse less than two years ago and has led it on an aggressive expansion campaign that strikes fear into the hearts of competitors. Based in Dallas, SW expects to do half a billion dollars' worth of business this fiscal year and over a billion next year, and is expanding rapidly into new markets.

Morton scored a major victory by persuading the historically-mail-order-only Dell Computer to begin selling its hardware through Soft Warehouse as well.

The company opened its first Southern California store in 1990, and will be expanding there and in Northern California, a move expected to have a profound effect on other retailers.

Therese Myers

President and Founder
Quarterdeck Office Systems

Myers runs a small, private company with a loyal and driven development team and an installed base of users who serve as the best advertisement for DESQview, a windowing, multitasking environment for PCs of all speeds and vintages. Doomsayers predicted that Windows 3



would be the death knell of DESQview, but strangely enough this failed to happen. Not only did DESQview adapt nicely to the demands of Windows and, in fact, allow it to run under DESQview, it ran

users' old DOS applications better than Microsoft's product.

Not letting the grass grow under its feet, Quarterdeck is exploring the X Windows standard, currently the predominant graphics environment for UNIX workstations, as a new area of product development.

John Nagle

Maybe it's just because so many of 1990's important industry events played themselves out in the court-

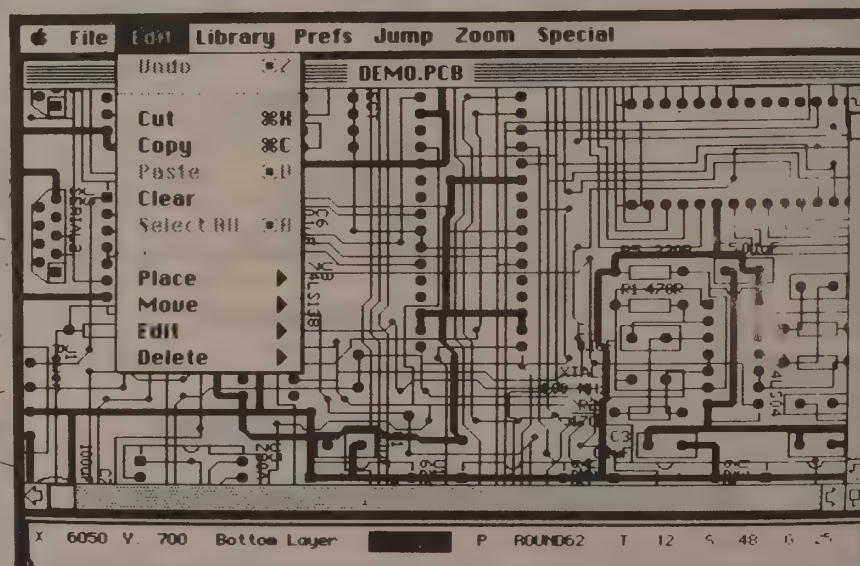
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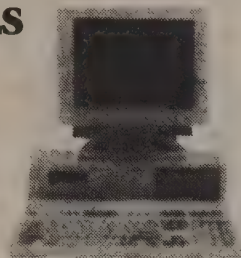
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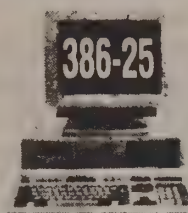


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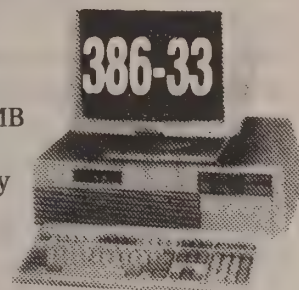
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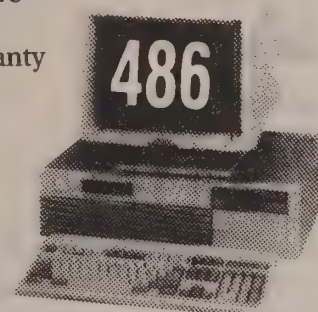
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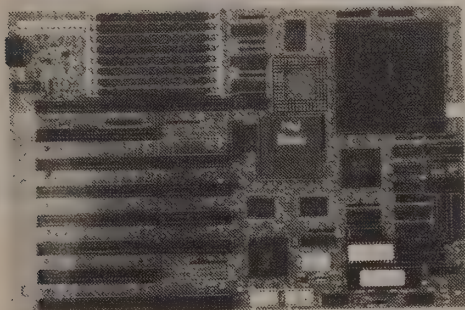
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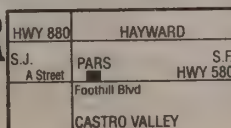
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room, but we feel that Nagle deserves some sort of recognition for Legal Reality Check Of The Year.

Along with security expert Dorothy Denning, Nagle was called as an expert witness by the defense in the trial of Craig Neidorf. Neidorf, a 20-year-old pre-law student, was up on charges of interstate transportation of stolen trade secrets because his online newsletter, *Phrack*, published a Bell South document describing some specialized functions of the 911 system. A phone phreak named Robert Riggs had logged on without authorization to a Bell South computer (which, incidentally, had no password protection) and copied the document, then passed it to *Phrack*. Bell South valued the document in question at \$79,000+ dollars and insisted it was proprietary, secret information.

The case, however, fell a little flat when Nagle, after a little research, was able to conclusively demonstrate that the information contained in the highly proprietary, secret document was available to any interested member of the public from Bellcore for less than \$39.

Regrettably, however, this denouement was not achieved before Neidorf had run up legal bills in six figures.

Jan Nelson

Jeanne Dupree

Founders

Apple Recycling Program

An anonymous reader, whose tale was confirmed by the folks at Apple PR, reports, "I was most impressed by Jan Nelson and Jeanne Dupree, who got the idea for Apple's in-house recycling program and, with impressive info on potential savings, convinced Sculley and the executive staff to launch it. Employees participate heartily. Grass-roots idea takes fire with concerned individual employees who champion to execs, get support!"

Both women have since left Apple, however, and we were unable to contact them directly. Nonetheless, we agree with Mr. Anonymous and with Apple that this is exactly the sort of thing that the MicroTimes 100 exists to acknowledge, and we salute them.

Jack Noonan

President and CEO

Microrim

1990 saw a good deal of turbulence in the PC-based database market, and one of the companies that came to increased prominence was the still-private Microrim, with new versions of its flagship product R:BASE—R:BASE 3.1, which offered compatibility with dBASE III and III PLUS applications and data and allowed users to work with files in both formats transparently and concurrently, and Personal R:BASE, a compact relational database bringing R:BASE capability to the laptop and home office market.

Noonan perceives the huge installed base of dBASE users as a promising market for R:BASE's historic strengths—ease of use and quick application development. On the occasion of 3.1's release, he remarked that the company "sees an enormous market opportunity to help three million dBASE users, who need a more usable product. Companies using

dBASE can keep running their old dBASE III and III PLUS applications without missing a beat, but as users begin to understand the R:BASE product advantages, we anticipate a significant migration."

In view of the escalating troubles of Ashton-Tate by year's end, Noonan may have spoken more prophetically than he knew.

Ray Noorda

Chairman, President, CEO

Novell, Inc.

In the seven years he's been at Novell, Noorda has transformed it from a faltering hardware supplier to the undisputed leader of the increasingly complex PC networking universe. His strategic know-how and management style have helped the company not merely survive massive growth but thrive on it. Part of that strategy was a planned merger with Lotus, which would have resulted in a huge company positioned to take advantage of most significant market trends of the decade. However, the failure of the merger seems not to have hurt Novell—while Lotus's stock has plunged in recent months, Novell announced a 2-for-1 stock split in July, and in December posted a 94% increase in net income.



Peter Norton

Founder

Peter Norton Computing

1990 was an unusually eventful year for Norton. He brought the fabled Norton Utilities, hailed for years by PC users as the salvation of their deleted files and trashed hard disks, to the Mac and UNIX platforms (the latter a particularly neat trick since, when you delete a file in UNIX, it's *gone*). And as if that weren't enough, he proceeded to sell his company to Symantec, thereby creating a truly formidable multiplatform utilities empire. He remains at the helm of Norton Computing, which stays at its Santa Monica headquarters.

Adam Osborne

Director

SVT

Moving on from Paperback, Osborne has launched a new startup with two colleagues, Anil and Sucheta Kapuria. Based in Santa Clara, the new company is currently manufacturing 386 and 486 motherboards for the US marketplace, but its ultimate plan is to build a state-of-the-art surface-mount-technology facility in India. "That," says Osborne, who's long been known for touting India's high-tech capabilities, "is where the smarts are these days."

We wish SVT a prosperous and litigation-free future.

David Packard

Chairman

Hewlett-Packard

As it evolved from the fabled garage of founders William Hewlett and David Packard, their startup was set apart from other companies not only by the quality of

We Also Seem To Have A Prankster Or Two...

One thing about MicroTimes 100 ballots—we sure learn some interesting things following up on some of them.

For two years now this guy in Sierra Madre has been sending us ballots nominating one Ferdinand Feghoot. Feghoot's Distinguished Achievement, according to this fan of his, was devising "a plan to convert obsolete home computers such as Coleco Adam and Mattel Aquarius for Smart Pebbles aspect of SDI, saving many millions of dollars."

Well, this sounded like a story to us. Alas, the said Mr. Feghoot never seems to answer his phone, making it difficult to figure out the details of this boon to the taxpayer. So we're making phone calls to various people trying to figure out what the deal is, and we finally get to Fearless Correspondent Wayne Yacco.

When Yacco gets done laughing, he informs us that Ferdinand Feghoot is a recurring humorous sci-fi character. He also explains (hey, those of us here on the Berkeley Border don't spend that much time on the fine points of SDI) that Smart Pebbles is essentially a space-borne shotgun, designed to scatter high-tech blunt instruments in space with which to bonk enemy missiles, satellites and the like on the head.

Somehow we think that converting Coleco Adams to this purpose is indeed an idea whose time has come. Undoubtedly there are a few people with VIC-20s and Osborne 1s and Seequa Chameleons who'd be willing to donate their hardware for this highly patriotic purpose.

So we hope Mr. Feghoot surfaces long enough to talk to us about this sometime, and if he does we'll get back to you!

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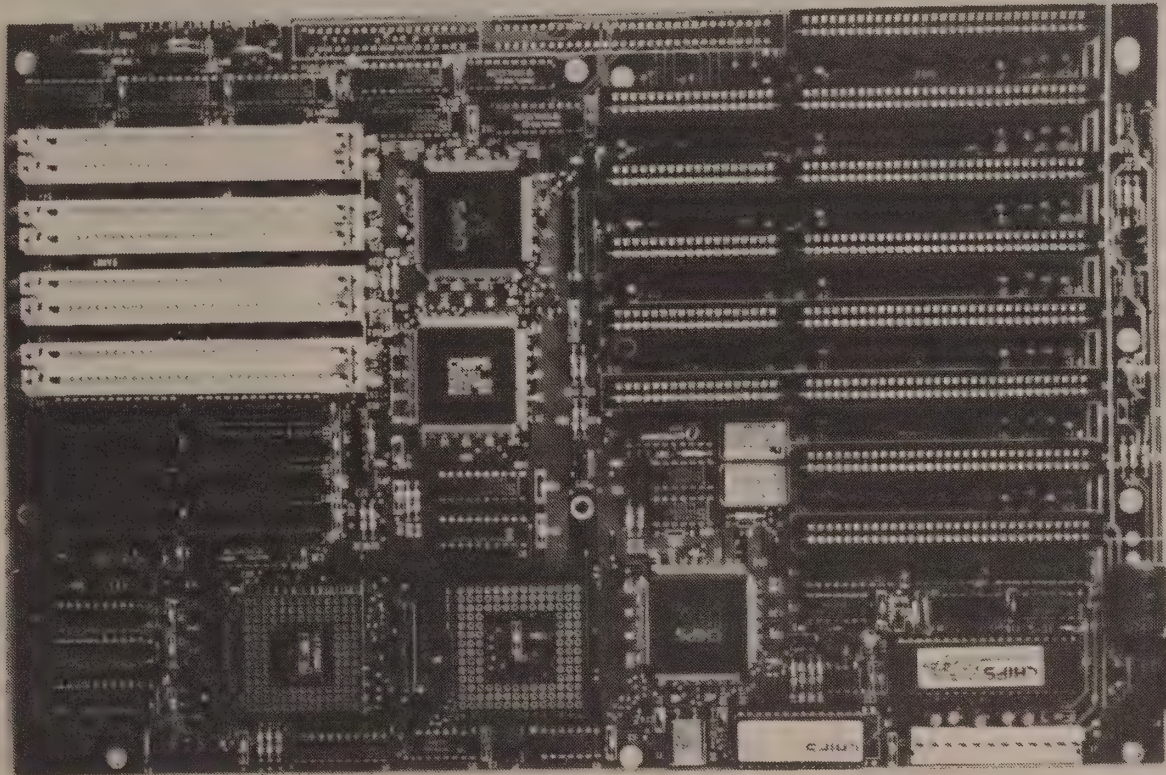
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its technology but by its founders' philosophy of "The HP Way," a set of principles based, long before it was fashionable, on the notion that the company prospered best when management, employees, and customers realized that they were in this together.

In recent years, megagrowth and changing markets have taken their toll at HP, and despite successful and innovative products, the company as a whole has seemed to be floundering.

The response to this challenge came this year from a somewhat unexpected quarter. Packard, at 78 long since retired from active management of the company, stepped in and assumed an active role in running the company he co-founded 51 years ago, reorganizing things considerably in the process.

In an interview with Lee Gomes of the *San Jose Mercury-News*, Packard explained, "We have 90,000 people in the organization. Bill [Hewlett] and I feel a very solemn responsibility to those people. They joined the company, many of them, because of the HP Way. We have a tremendous number of shareholders who became shareholders because they had confidence in our policies. We have a responsibility to make sure those things on which their faith was exhibited are satisfied with the continuation of those policies.

"I don't think it's any use talking about whose fault [HP's current malaise] is. It's probably Bill's and my fault for not paying more attention to this before. The important thing is we've identified these problems, and we're going to fix them."

Jeffrey P. Papows

Chairman

Software Business Practices Council

President and COO

Cognos, Inc.

Along with Robert Weiler of Interleaf and David Mahoney of Banyan Systems, Papows recently founded the Software Business Practices Council to improve the integrity of the software industry as a whole. "Neither the best people in the world, nor the most spectacular technological achievements, can ever overcome the damage to a reputation tarnished by dubious business practices," says Papow. Founding member companies include the likes of DEC, Hewlett-Packard, Lotus, and Ingres.

Aubrey Pilgrim

Author

Never mind the recession—power users on a budget have found Pilgrim's books a great resource for putting together their dream systems. The latest, *Build Your Own 80486 PC and Save a Bundle*, helps even the beginner configure the ultimate PC system.

Jerry Pournelle

Columnist

Pournelle's sometimes cranky but always informative *BYTE* column is a valued source of information for computer users from beginner to wizard. Pournelle provokes a fair amount of argument and dissension, but rarely boredom. Ever since some reader sent him a diskette of a program that turned out to be dBASE, he's been bombarded with new products from hopeful entrepreneurs, and he's become an authority on recognizing genuinely useful

products at an early stage of their existence.

Safi Qureshey

Thomas Yuen

AST Research

After a traumatic 1989, AST emerged from its reorganization aggressively seeking market share, ending the year as the nation's fifth-largest PC manufacturer (after IBM, Compaq, Apple and Zenith). Yuen was much given to statements about AST's plans to take on IBM and Compaq, as well as generally kill off the minicomputer market. Part of the company's recent success has been its international effort—it's attained significant market share in Japan, for instance, with its dual-language machines, and it won a contract to supply approximately \$1 million in 486-based computers to the Tokyo Grain Exchange.

The founders also spent some time addressing problems that had plagued AST during its turbulent years—for instance, it recently added toll-free customer support on Saturdays.

Jack Rickard

Editor

Boardwatch Magazine

Says reader Matthew Rapaport, "I nominate Jack Rickard, editor of *Boardwatch Magazine*, who has certainly done a great deal for the BBS networks of the US. His magazine has brought together all kinds of interesting information about the BBS world, its issues, standards, hardware, software, etc." We also find *Boardwatch* a valuable resource, and we're happy to agree with Matthew's suggestion.

John Roach

Chairman of the Board and CEO

Tandy Corporation

Roach led the Tandy electronics empire to further growth in 1990, expanding its international operations with the acquisition of microcomputer pioneer



Victor, among others. In addition to a range of 386SX desktop machines, Tandy also broke new ground in the portable computing field with new offerings from its GRiD division: the GRiDpad, the first handwriting-input MS-DOS computer, and the 1450SX, an ultra-light full-featured 80386SX laptop.

T.E. Rodgers

President and CEO

Cypress Semiconductor

Something of a non-traditionalist, Rodgers has been a force for innovation in the industry since he co-founded Cypress in 1982. Historically, Cypress has focused on providing specialized and very fast chips for niche markets; mindful of the Japanese takeover of the DRAM market, it's adopted a strength-in-diversity approach.

Rodgers recently told *Fortune*, "I would rather see our billion-dollar company of the 1990s be ten \$100 million companies, all strong, growing, healthy, and aggressive as hell. The alternative is an aging billion-

dollar company that spends more time defending its turf than growing."

The strategy seems to be working. Cypress is bucking the industry slowdown with record earnings and maintaining its reputation for technical excellence. A particularly strong contender is its ROSS Technology subsidiary, which recently aced out LSI Logic to become the provider of CPUs and other chips for Sun's SPARCstation 2 and SPARCserver 2 product lines.

Heidi Roizen

President

T/Maker Company

It was a year of new directions for T/Maker, as the company shipped its long-awaited upgrade to WriteNow, and its founders, Roizen and partner Royal Farros, made the strategic decision to accept venture capital (from startup VC Hummer Winblad) and pursue growth.

We hear a lot of praise for Roizen in our travels through the industry—for example, reader Chris Tompane writes, "I think she has done a tremendous amount to move Apple in the right directions. Also, she has done a lot of work in helping the software industry. As a final point, she adds a lively spark to the industry."

Martin Sacks

President

International Microcomputer Software (IMSI)

Sacks is probably somewhat unusual in the industry for having founded a company, a CAD firm called Milan Systems America, sold it in 1988 to IMSI, and then returned in June of 1990 as president of IMSI. Like many small PC software houses, IMSI, perhaps best known in the past for its PagePerfect (IMSI Publisher) desktop publishing software, was having a rough time competing in changing markets. Sacks managed to achieve a rapid turnaround in the company's fortunes, and at COMDEX announced a diverse range of new products from graphics packages to virus cures. We expect to be hearing a lot from IMSI in the coming year.

Jack Schoof II

President and CEO

Artisoft

Schoof's little Arizona-based LAN company has been attracting a lot of notice lately with its LANtastic product line, which scores points with users for low cost and high performance, as well as, recently, voice capability. For two years running, the company's figured prominently on *Inc.*'s annual list of the fastest-growing privately held companies in the US, and it seems poised to ride the wave of LAN expansion during the '90s.

John Sculley

Chairman and CEO

Apple Computer

With shifting markets, managerial conflicts, and a host of other problems, 1990 can't have been one of Sculley's favorite years at Apple. By year's end, however, the company was on a relatively even keel except for the fact that there weren't enough low-cost Macs to go around.

After the much-publicized dissension between
Continued on page 118

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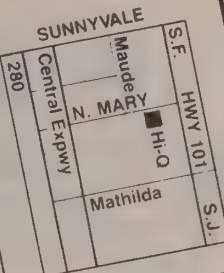
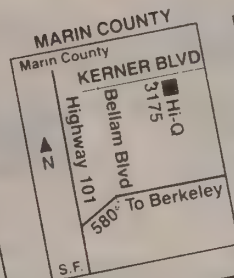
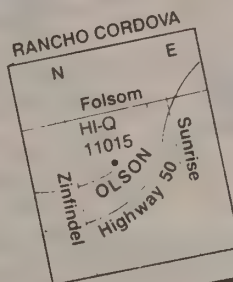
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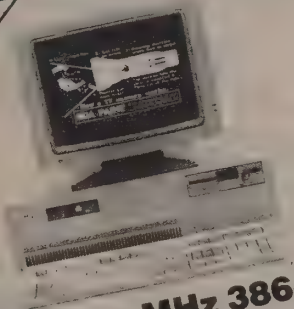
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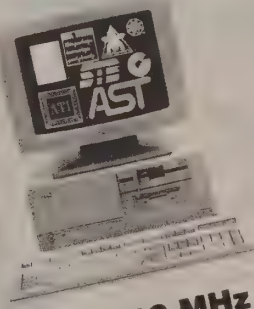
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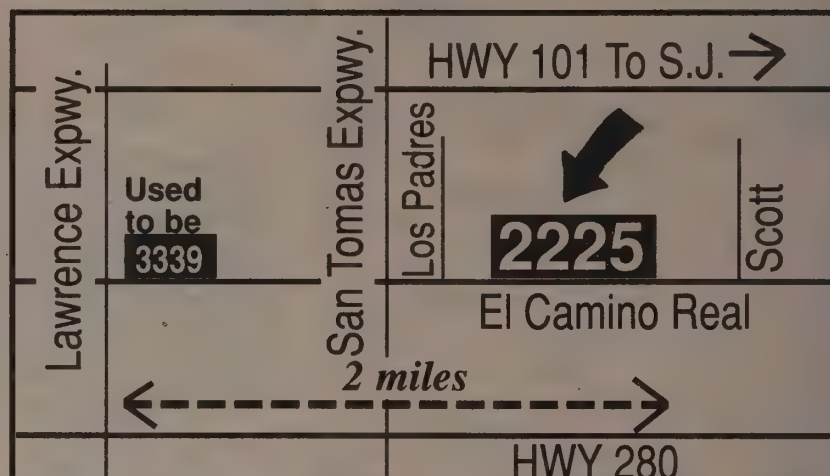
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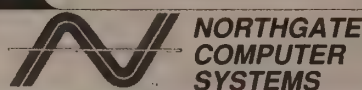
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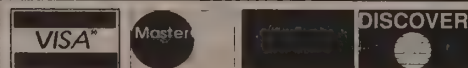
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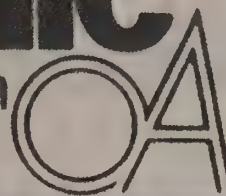
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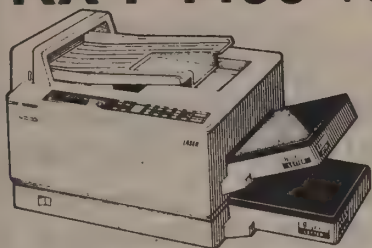
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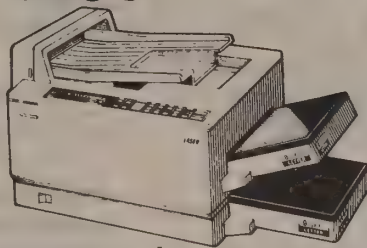
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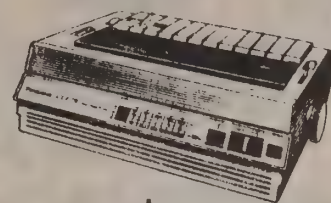
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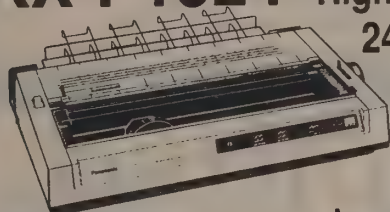


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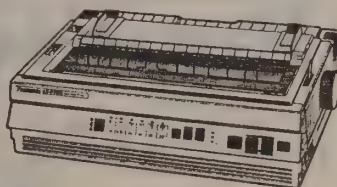
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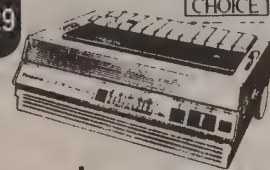
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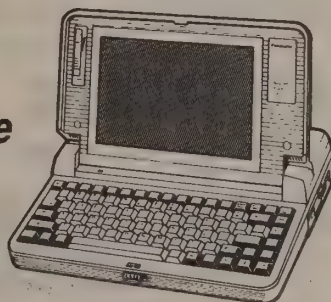
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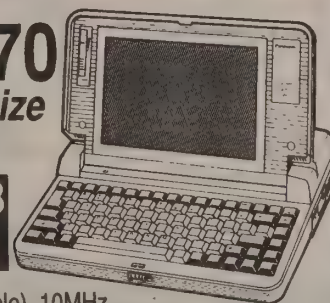
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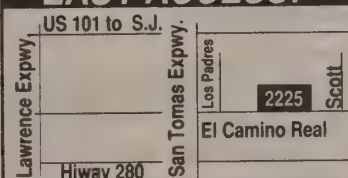
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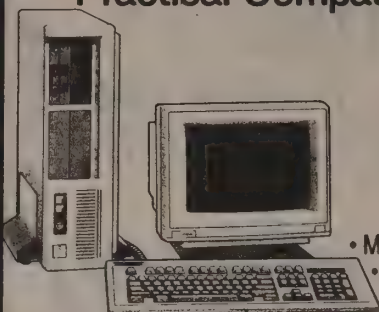
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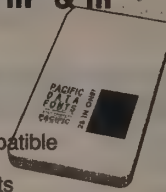
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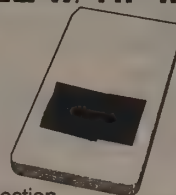
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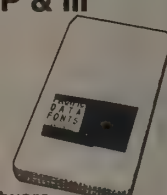
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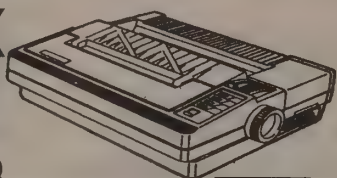


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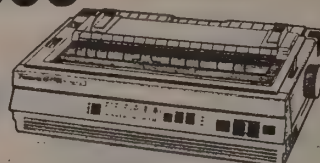
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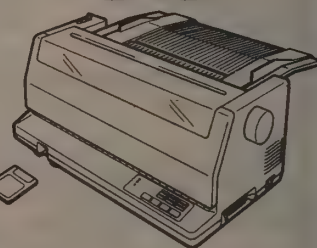
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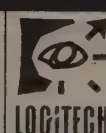
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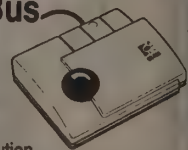
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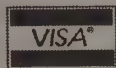
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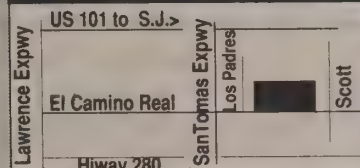


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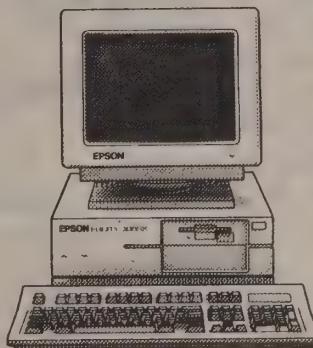


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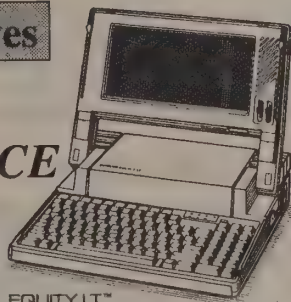
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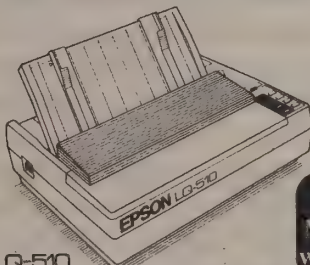
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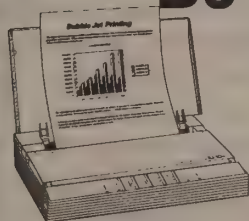
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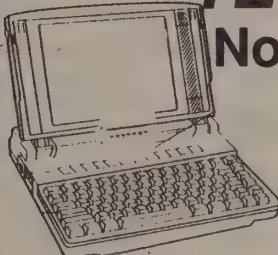
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PRICE SUBJECT TO CHANGE WITHOUT NOTICE

Jean-Louis Gassée and Allan Loren (both now departed), Sculley assumed the role of president of Apple Computer. By November, however, he had passed that responsibility to COO Michael Spindler, and 1991 should see him with more time to devote to the company's long-term strategy and the joys of R&D.

Jonathan Seybold

President

Seybold Seminars

Seybold's seminars and expositions are highly regarded for their professionalism and for the quality of their presentations, and the Seybold Publishing Conference has established itself as a must-attend



event every year. After another successful and event-studded year, Seybold sold his company to Ziff-Davis, publisher of (among others) *MacWeek* and *MacUser*. Don't expect to see any adverse changes in the show—the Seybold

companies will continue to run as autonomous entities. What seems more likely is that Seybold's know-how will be a considerable asset to Ziff, which seems to be expanding its operations into the conference-and-trade-show business.

Rich Shapero

President

Sitka Corporation

It's still a matter of debate whether this independent-minded wholly owned subsidiary of Sun did well to change its name from the widely recognized TOPS to Sitka (visions of Activision/Mediagenic come to mind). But its rationale is both engaging and suited to its business strategy—comparing itself to the multicultural Alaskan city, Sitka sees itself as “devoted to the concept of helping people with radically dissimilar computers and operating systems share information and ideas.”

During 1990 new president Shapero hired new management and built up a team designed to expand the company's position as the leading vendor of network software for mixed Mac/PC/UNIX networks. As transparent access among different platforms becomes one of the most crucial needs of business in the '90s, Sitka and its parent company Sun (which also spent 1990 vigorously pursuing strategic alliances and showing off its good citizenship in multivendor networks) are positioned as key players.

We'd also like to make note of the user-friendly upgrade policy that accompanied the release of the updated software: assuming you have older versions running on different nodes of your network, you will be able to upgrade them all (serial numbers intact) from a single copy of the new Network Bundle. So here's a salute to Sitka for good customer relations.

Stan Shih

Chairman and CEO, The Acer Group

Leonard Liu

President, Acer Inc.

Chairman and CEO, Acer America

Acer emerged from significant change and reorganization in 1989 to position itself as a multinational contender in the US, Pacific Rim, and European markets. Shih noted in the company's most recent annual report that “the company goal is to become a world-class corporation in the same vein as IBM, Hewlett-Packard, Compaq, and Apple.” The company is a world leader in multilingual systems and has established R&D facilities in both the US and Taiwan.

Since Liu's arrival in 1989, Acer has entered into a joint agreement with Texas Instruments to produce DRAM chips in Taiwan, and has pushed the development of 386 and 486 systems based on the EISA and MCA standards.

Roger Sippl

Chairman

Phillip White

CEO

Informix

Sippl and White are one of the industry's best tech-noid/marketroid management teams, and the company's made great strides in multiplatform development and general visibility in the microcomputer universe since White came on board in 1989. During 1990 Informix showed some impressive implementations of its database technology, particularly in state-of-the-art interfaces on the Macintosh, often based on the tools in Wingz.

Robertson Reed Smith

HyperCard Zealot/Engineer

Apple Computer

Certainly the entire HyperCard development team deserves a lot of credit for the new, improved, and long-awaited version that shipped in late 1990. Sylvia Paul of Software Ventures, BMUG, and other noble organizations nonetheless wants to single out Smith, a member of the HyperCard 2.0 development team, for particular attention, not only for his distinctive sense of humor but because, she says, he “epitomizes the perfect match between human intelligence and the technology of the Mac.”

Kieth Sorenson

President, CEO, Chairman of the Board

RasterOps

RasterOps has been struggling to establish a place for itself in the crowded display technology arena for a couple of years now (there was an ill-fated and short-lived alliance with Jasmine some time back). In 1990 it finally hit its stride, offering 32-bit products not only for Macintosh but for PS/2, IBM RISC 6000, and SPARCstations. It also contributed mightily to the industry by introducing the first 24-bit color under \$1,000.

Michael H. Spindler

President And COO

Apple Computer

A German-born veteran of DEC and Intel, Spindler joined Apple in 1980 as marketing manager for Apple's European ventures and eventually rose to president of Apple Europe before being appointed to the Chief Operating Officer spot in 1990. In Novem-

ber, having not only survived internal upheaval in

PHOTO: APPLE COMPUTERS, INC.



Cupertino but made great progress in getting Apple's sales, customer relations, and new products back on track, he assumed the additional responsibilities of president.

At the end of 1990, things were looking good for Spindler. The biggest short-term problem he faces is one most vendors would kill for: demand for the new low-cost Macs is so high that Apple can't make them fast enough.

Cliff Stoll

Astronomer

Stoll's efforts to track down the source of a 75¢ billing error on the Lawrence Berkeley Lab computer a few years back led him down a convoluted trail through the phone system, ultimately resulting in the arrest of several enterprising West Germans who were breaking into woefully insecure US military computers and gleaning informational tidbits for the KGB. He related the saga in *The Cuckoo's Egg*, which became a colossal bestseller, being both a good read and a nearly unique discussion of computer security issues and problems, comprehensible to ordinary humans as well as UNIX wizards.

Since then the yo-yo-wielding Stoll has found himself a reluctant expert on computer security, and has also found it difficult to pursue his chosen career of astronomy in peace, since every teenage gunslinger seeking a notch on his modem seems to be trying to break into his system. Which isn't hard, because Stoll, an academic who believes in open, collaborative work, doesn't secure his system. “I don't want to be a computer cop,” he says at the close of the book. “I don't want our networks to need cops.”

Donald Thomas

Computer Marketing Manager

Atari

Owner

Artisan Software

Author

The Revolution Handbook

Thomas is the quintessential hardcore Atari ST user. By day he works at Atari helping customers with Portfolios, Atari's DOS-based videocassette-sized computers. By night he works in his ST-filled house in Manteca, running his ST software company, Artisan. He also spearheads something called The Revolution.

Lots of Atari users have long been frustrated at the company's failure to aggressively promote the machine in the US—a frequent comment being that the company is doing so well in Europe that it doesn't have to worry about the US market. For most American ST users, moving to Düsseldorf for better hardware and software availability is not one of the options.

As an ST aficionado and software developer, Thomas worried about the prospect of the ST not only failing to achieve the installed base it deserved, but utterly vanishing from the face of the continental US. So he did something about it. He published, online (CompuServe and GENie) and in hard copy, *The*

Continued on page 133

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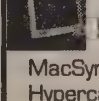
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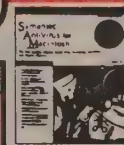


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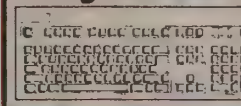
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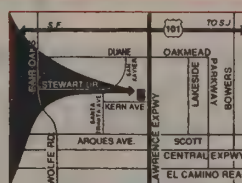
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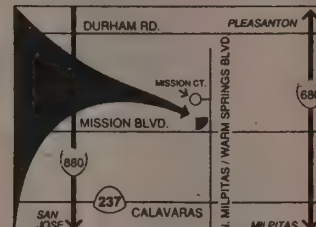
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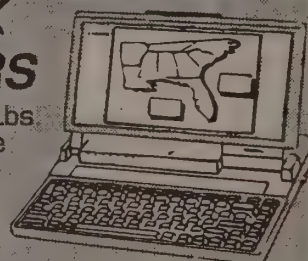
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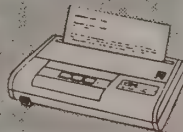
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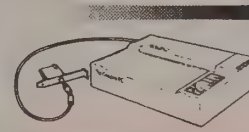


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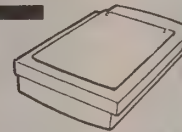
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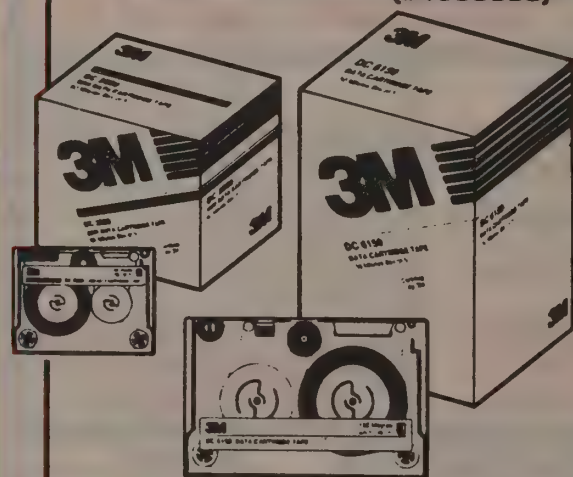


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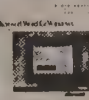
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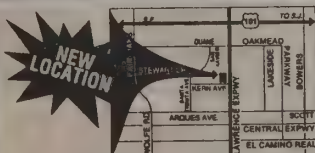
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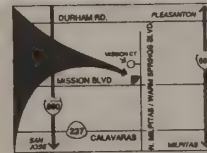
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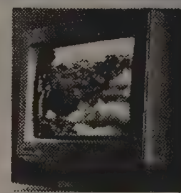
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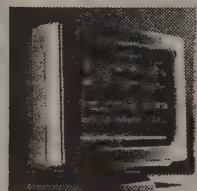
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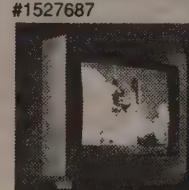
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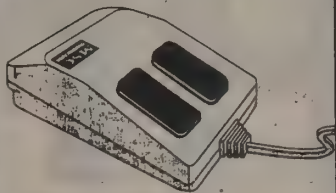
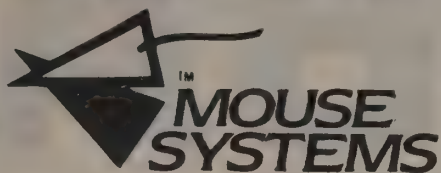
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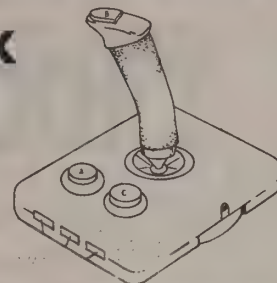
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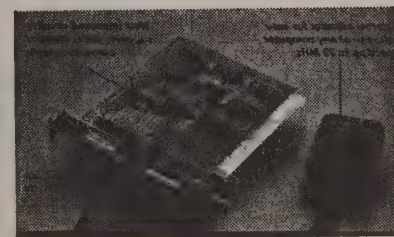
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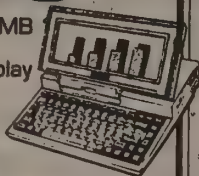
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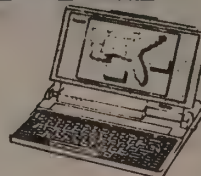


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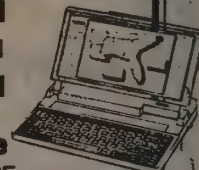
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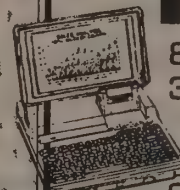
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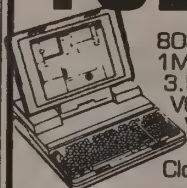
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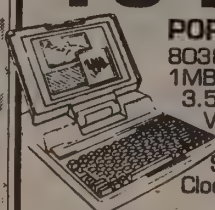
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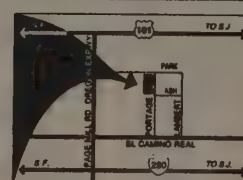
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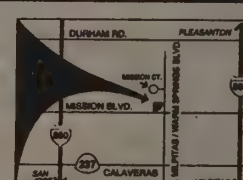
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8

new things you can do in bed

WITH **X-10 POWERHOUSE™**

NUMBER ONE IN HOME AUTOMATION

8 Turn lights on from outside house

2 Dim your lamps from anywhere in the house

5 Use the telephone to control your lights and appliances before you get home.

6 Use the mini-controller to control everything from your bedside so that you can do other things in bed

1 Turn on and off your T.V. or other appliances from anywhere in the house.

4 An X-10 wall switch can act just like a regular wall switch too!

3 Control the heating throughout the house with your X-10

7 Use your PC or Mac to control everything whenever you want.

Now you can use the power of your computer to control all the lights and appliances in your home! All without tying up your computer. In the "install mode", you select a room in which to install graphical icons which represent what you want to control. Then in the "operate mode" you select a room in which the light or appliance you wish to control is located. You use the joystick to point to the icon representing the light or appliance you wish to control. Then point and click to select whether you want to turn on or off, Today, Tomorrow, Everybody or on a Specific Day and then set the time you want it to go on or off.

1 APPLIANCE MODULE

Receives signals from the timer or mini-controller to turn on or off a TV, air conditioner, stereo and other appliances anywhere in the house.



\$14⁹⁵
#118600 AM466

2 LAMP MODULE

Receives signals from the timer or mini-controller to turn lamps on and off anywhere in the house. Full range dimming is possible from X-10 manual controllers.



\$12⁹⁵
#1481150 LM465

3 THERMOSTAT SETBACK CONTROLLER

Mounts on the wall under your existing thermostat & plugs into the appliance module. Works with any thermostat so you can automatically set back heating or air conditioning using the timer, or remotely turn up heat/a.c. before you get home using the telephone responder.



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TH2807 #151880

4 WALL SWITCH MODULE

This replaces your ordinary wall switch so that you can control any of the outlets in the house, without any extra wires.

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5 TELEPHONE RESPONDER

Controls your lights and applications from any telephone, wherever you are! Transmit control signals with your 3 digit security code to control up to 8 lights and appliances.

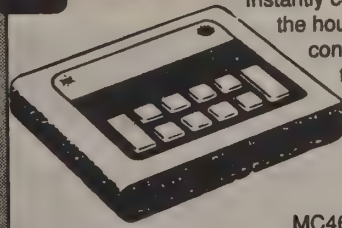


New Model!
allows for Bypass
of answering
machine

\$74⁹⁵
#122064 TR551

6 MINI CONTROLLER

Instantly control up to 16 lights & appliances throughout the house with the push of a button from one convenient location. Lets you "group together" lights to dim or turn on.



SL503

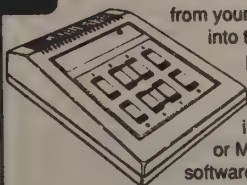
MC460
#1299656

\$10⁹⁵

7 COMPUTER INTERFACE

The Home Control Interface is a very sophisticated timer which is programmed from your computer and then disconnected. Simply plug lamps and appliances into the modules. Program different events for different days. You can even program your lights to dim at a predetermined time. If you don't have a computer at home, you can program the interface at work, pop in a nine volt battery and bring the Powerhouse into your home! The interface is available for IBM or Mac and comes complete with software and connecting cable.

After programming, it can be disconnected, to free up the computer for everyday uses.



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8 HOME SECURITY SYSTEM SLEEP LIKE A BABY

The Protector Plus is a "wireless" home security system. You arm and disarm the system with a Wireless Remote control. It installs in minutes and requires no tools or wiring. You can install up to 16 Door/Window Sensors. These sensors are "supervised", i.e. self-checking.



#1481116

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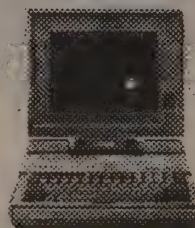


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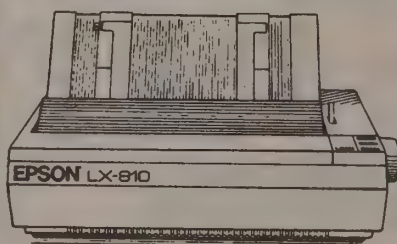


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SelectType Front Control Panel
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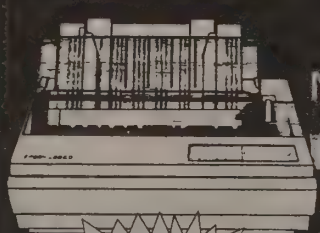
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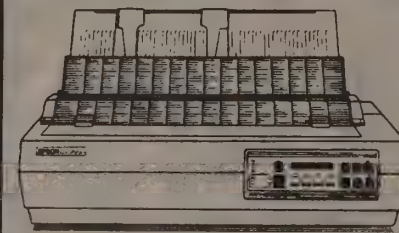
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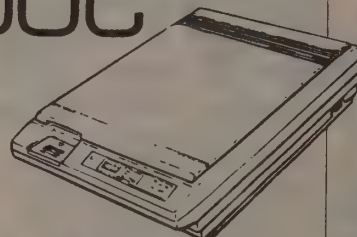
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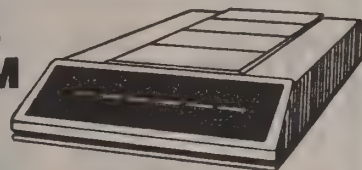
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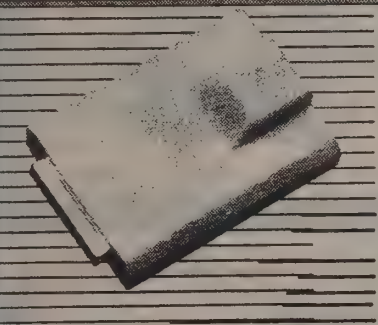
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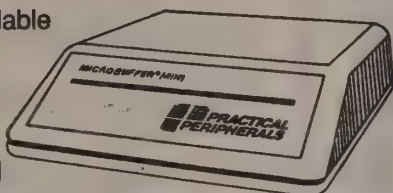
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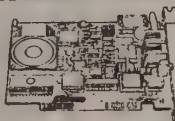
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32K to 512K
Parallel
to
Parallel

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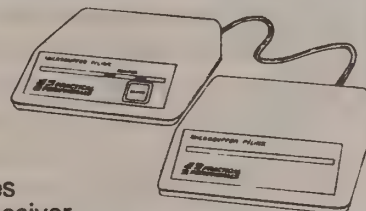
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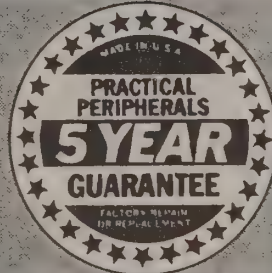


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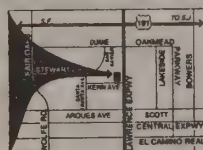


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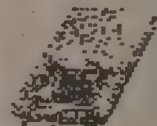
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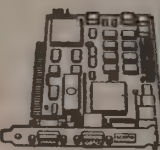
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Easy To Install
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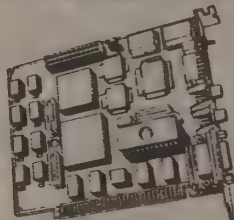
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2MB Exapandable To 4MB...\$179

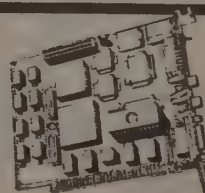
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Internal 1/2 Card
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INTEGRATED INFORMATION

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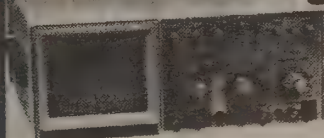
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The ITT Advanced Math Coprocessor radically reduces the amount of time involved in numeric calculating.

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20MHz DUAL-TRACE OSCILLOSCOPE



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• Dual or Single Trace Operation
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BK-2120

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40 MHz DUAL-TRACE OSCILLOSCOPE



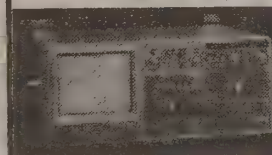
- 1 mV/div sensitivity
- 20 calibrated sweeps
- Video sync separators
- Z axis input
- x10 sweep magnification
- Single sweep
- V mode - displays two signals unrelated in frequency
- Channel 1 output

BK-1541

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BK PRECISION MAXTEC INTERNATIONAL CORP.

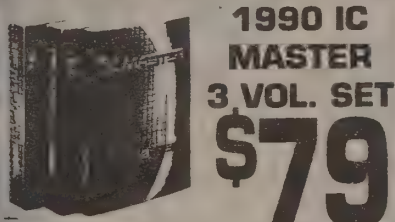
60 MHz DUAL-TRACE DUAL TIME BASE OSCILLOSCOPE



- 1 mV/div sensitivity
- Sweep to 5 ns/div
- 22 calibrated ranges - main time base
- 19 calibrated ranges - delayed time base
- Signal delay line
- V mode - displays two signals unrelated in frequency
- Component Tester
- Z axis input
- Single sweep

BK-2160

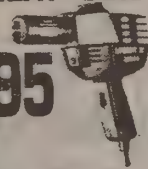
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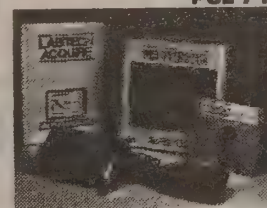
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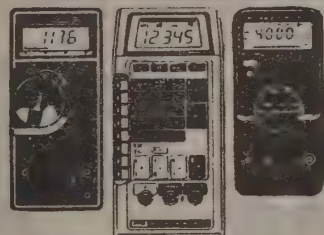


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For the office or home, this phone has all the features you need. It has a K-size handset, 28 station automatic dialer, hold button, and much more.

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MODEL
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ANSWERING MACHINE

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MODEL
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Panasonic FAX MACHINE WITH ANSWERING MACHINE

With this new Fax from Panasonic, one line is better than two! It has a built in answering machine to eliminate the need for sophisticated switching arrays! You can either leave a message, send a fax or both with this new unit and check out this hot low price! Hurry supplies are limited!

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EPSON

Priority Fax 3000

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FAX 3000

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Electronic Organizers are very helpful because you can store notes, telephone numbers, schedules, etc. in memory and they are very small. You can have your very own for just...

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Sony's Compact DeskTop Transcriber has the Most Popular Features! It offers foot pedal operation with 3 position backspace, 2-speed operation, telephone recording jack, conference recording and much more! It even comes with a headset!

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MODEL
M-2000

HEWLETT PACKARD Authorized Dealer EXPANDABLE SCIENTIFIC CALCULATOR

HP introduces the Ultimate Personal Computing Tool, the 48SX. This scientific calculator truly does it all! It has 32K of internal memory and can be expanded to an outstanding 288K! There are application expansion cards as well as an interface to your IBM compatible or Mac computer. You won't believe what this unit will do for you!

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MODEL
48SX

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98 FOOT ROLLS

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Stop those embarrassing spelling errors! Now you can bring a pocket spell checker from FRANKLIN wherever you go... for less!!

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MODEL
PS99

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MODEL
HP-12C

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For the "on-the-go" individual, a Cellular Phone is a must and NovAtel makes it affordable. This phone has a 9 number auto dialer and operates on a 12 volt cigarette lighter in your car. With the optional battery, you can be completely portable!

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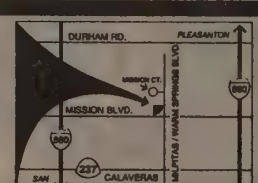
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Revolution Handbook. Which, among other things, exhorted ST users to be vocal about their product and support needs. A frequently recommended activity is writing letters to Atari President Sam Tramiel.

In a recent profile in *STart* magazine, writer E.J. Koch explains the delightful irony of the situation: "The company is close-mouthed regarding Thomas's efforts. Sam Tramiel refused to comment, but offered Thomas as his spokesperson regarding The Revolution. Tramiel is in the strange position of having his customers usurp his business plans. On one hand, any publicity the Revolutionaries generate supposedly benefits his sales, but on the other hand, he's being pressured to spend advertising money where the consumers, not the company owners, think best. And to top it all off, he is Thomas's boss."

Michael Tiemann

President

John Gilmore

Generalist

David Wallace

Director of Support

Cygnus Support

Freely distributable software, including that created by the GNU (GNU's Not UNIX) Project, has long been a mainstay of the UNIX universe, and in many cases has found greater favor than its commercial equivalents. A key component of the free software principle has been the idea that since users have immediate access to the source code, bugs get fixed and the code gets improved far faster than in the commercial environment. One practical ingredient that's been lacking, however, is a centralized support forum for keeping users supplied with the most current information and help with the product.

Enter Cygnus, founded by free software advocates Tiemann (author of the g++ compiler), Gilmore (Sun Employee #5 and author/distributor of free software for eight years) and AI wizard Wallace. Since its inception in 1989, Cygnus has served free software users, including AMD, Intel, Metaphor, and numerous government sites, and it's now working with a second tier of customers in the software development community. The company combines a passionate advocacy of the free software principle with technological expertise and practical problem-solving to make this novel collaborative design and distribution concept viable.

Enzo Torresi

President and CEO

NetFrame

Olivetti and Businessland veteran Torresi started NetFrame to develop and market mainframe-class microprocessor-based network servers, the first to utilize parallel processing technology for such an application. As high-speed networks become increasingly crucial to keep business users competitive, NetFrame is doing respectable business. Torresi expects the company to offer Compaq some formidable competition in the burgeoning high-end network server market.

Sam Tramiel

President

Atari Computer

Tramiel took a lot of heat from unhappy ST users in 1990 over his apparent decision to emphasize Atari's historically strong European market at the price of near-invisibility in the US. Leaving aside the probability that Tramiel will have the last laugh in 1992 when the company's an EC household word, by COMDEX Atari was showing and shipping some new ST technology, maintaining its commitment to technical excellence at low cost, and apparently making serious attempts to mend its fences with its fanatical and long-suffering user base.

Reichert Von Wolfsheild

Leo L. Schwab

William A. Ware

Silent Software, Inc.

Creators, Disney Animation Studio

There was a lot of innovation and vitality in the Amiga community in 1990, and one of the best examples was Disney Animation Studio, designed by Von Wolfsheild and programmed by Schwab (author of the "Red's Dream" Amiga animation loop that spread outrage in the halls of Pixar) and Ware. DAS greatly enhanced the power and credibility of the Amiga as a professional animation system.

Bob Wallace

Founder and President

Quicksoft

As the principal author of PC-Write and an early pioneer of the shareware marketing concept, Wallace has built a prosperous and highly regarded company, which expanded its product line in 1990 to include PC-Write Lite, especially for laptop users and people who'd just as soon not deal with some of the complexities of "full-featured" word processing.

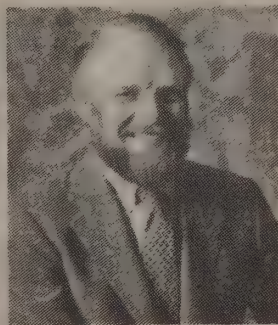
Wallace also serves as an all-too-rare example of win-win rather than cutthroat business practices. "My philosophy," he says, "is that I want to make a living, not a killing."

John Warnock

Chairman and Co-Founder

Adobe Systems

After 1989's Font Wars with Apple, Warnock reacted by opening up the PostScript font technology specifications and opting for extensive Windows development—which seems to have had the desired effect of



of the plan.

One of Warnock's finest hours in 1990 was a press event he didn't even attend—the rollout of the new NeXT machines. The black boxes incorporate a considerable amount of Adobe's graphics technology at various levels, and any doubts about PostScript's performance were dispelled by eye-popping, fast-moving true color graphics.

further entrenching PostScript as an industry standard and had the side-benefit of restoring peace with Apple. It remains to be seen just exactly what System 7 will do with fonts, but abandoning PostScript doesn't seem to be part

John Wharton

One of the neatest innovations we saw in 1990 came from John Wharton, an engineer and columnist for *Microprocessor Report*. He had a Mac Portable. He had a book contract. He also wanted to go to Fiji, where wall outlets turn out to be at something of a premium in the more remote areas. Consequently, he devised some solar panels for recharging the machine—a full day's sunlight is sufficient not only to run the Portable but to recharge two extra batteries for those rare days the tropical sun doesn't shine. Since the Mac Portable's at its best in bright sunlight anyhow, this turned out to be a particularly elegant solution.

This might not be quite as wonderful as the Poqet's ability to run one hundred hours on two AAs, but any resemblance of a Poqet to a full-featured Macintosh is pretty negligible anyway...

Will Wright

Co-founder, Games Designer

Maxis

Wright started working on what would eventually become SimCity—The City Simulator—in 1985. Released in 1989, the game has since garnered twenty domestic and international awards and attracted the best creative efforts of hordes of people who should probably have been doing something "productive" instead.

SimCity has since spawned several add-on products for urban architects who can't get enough. And at year's end, Wright's latest effort, SimEarth (co-designed with Fred Haslam and based on the Gaia theory of a global organism), not only gave happy Mac users new worlds to design, it seemed well on its way to repeating the commercial and critical success of its predecessor.

Dean Yu

Programmer

Yu made quite an impression at this year's MacHack conference with NetBunny, which carried off the Best Hack award. NetBunny is a little program that sends the pink Energizer bunny pounding his drum from Mac to Mac over an AppleTalk network. It's already a cult classic.

Rumor has it that Yu is discussing the product with EverReady. In these litigious times, we hope he manages to work out an arrangement allowing the wide distribution of the program.

Lotfi Zadeh

Professor of Engineering and Computer Science
UC Berkeley

In 1965, Zadeh first discussed what would be known as "fuzzy logic" in a paper entitled "Fuzzy Sets." Most of his colleagues appeared to think he was nuts, and much academic ink over the years has been expended in the cause of bashing his theories. Nonetheless, Zadeh kept working, exploring the relevance of fuzzy-set theory to such applications as artificial intelligence, decision analysis, expert systems, and neural networks. And these days, with fuzzy logic a key element in products from Canon autofocus cameras to Hitachi washing machines to Nissan and Subaru transmissions, to say nothing of the handwriting-input Sony Palmtop, Zadeh's "crackpot idea" seems to be making quite a difference. ■

Mac-DOS-XENIX

Storage And Backup

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BY ARI
DAVIDOW

I'm in an unusual situation. I do a lot of work on the Mac, but I own an IBM compatible running both DOS and XENIX. Each and every machine I was using was running out of disk space. Worse, the Mac I was using at the time had a 100Mb disk drive that took an entire afternoon to back up. I also had hard disks cluttered with programs and information that were seldom used, or seldom used together.

As I looked around, I realized that the problem wasn't necessarily going to be solved by getting larger hard disks for each machine.

It was about this time that I realized that my serious Mac-using friends had purchased removable 44Mb drives. These are marketed under a variety of brand names, but all are compatible, all use the same Syquest mechanism inside, and all use the same 44Mb removable cartridges at about \$70/per. The cartridges themselves look like compact disks on steroids.

It didn't take a whole lot of thinking to realize that if there were a PC board that could handle SCSI devices (the computer standard interface that's included on the Mac, and into which these things plug), we could avoid the hassle of networks and have a portable 40Mb hard drive to boot.

At the suggestion of BMUG's Randy Simon I called up his contact at DPI, a small electronics company in Hayward. BMUG regularly plugs DPI in the "choice products" section of its newsletter. Randy's contact did, indeed, have a low-priced, rather exquisitely reliable SCSI drive he could sell me for only \$650 (plus tax), disk included. For under \$150 he would be willing to add a top-of-the-line board that would drive the device from my not-particularly-top-of-the-line 386 clone.

The board is made by a company called Trantor. I called them up and grilled the tech support person for several hours. I was as-

sured that under all circumstances this particular board, the Trantor 128, would be happy to enable my machine to talk to DPI's machine.

SETUP

I picked up the equipment a few days later.

The documentation for the Trantor board was no less obtuse than most computer documentation, so I called Trantor the next day. The tricky element concerned a rite common among PC users called "setting the DIP switches." In this case, because the PC was never designed to be modified by mere mortals, it means that one picks an electronic address at random and hopes that no other piece of equipment is receiving email from the computer at the same location. There are loads of choices. Professionals, one presumes, have highly sophisticated equipment that tells them what is hooked up

where. Unfortunately, the PC operating system, MS-DOS, is not equipped to provide such information, in English, on its own. Hence, trial and error.

As it turned out, the first suggested switch setting worked just fine. I hooked up the board, plugged in the drive, installed the software and there it was. A brand new hard drive. The only difference between my old internal hard disk and the new SCSI external box is that I use the utilities that came with the computer board, rather than the DOS utilities, to format new cartridges.

Oh, and I can switch cartridges whenever I choose, or plug the Syquest drive into any other PC with a SCSI board, or any Mac with a SCSI port.

In short, installing the Trantor PC board took about twenty minutes of phone time, ten minutes of fiddling (time required to strip case off computer not included), and it worked perfectly with my off-the-shelf DPI

It didn't take a whole lot of thinking to realize that if there were a PC board that could handle SCSI devices (the computer standard interface that's included on the Mac), we could avoid the hassle of networks and have a portable 40Mb hard drive to boot.

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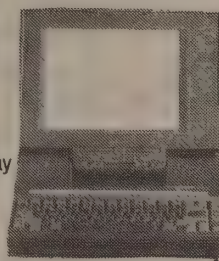
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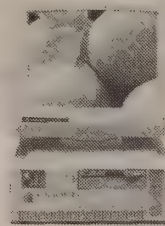
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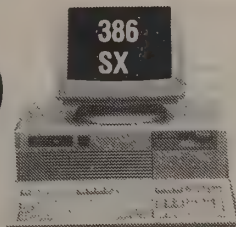


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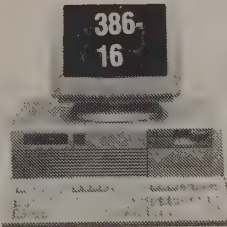
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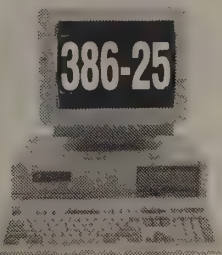
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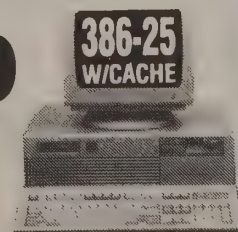
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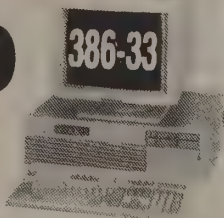


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Trantor T128 PC SCSI board, \$138

Both available from:

DPI
40 Corning Ave.
Milpitas, CA 95035
(800)825-1850

Western Data Access
(415)644-2396

Macintosh drive first time out. I did feel that the Trantor support person could have made things clearer without intimating that my lack of knowledge about PC innards was a personal defect. But he stuck with me until I got it right.

PERFORMANCE

The amazing thing is that the drive works just as I imagined. When I need to use a Mac, I simply take a Mac cartridge with all of my programs and current projects down to the local service bureau. If it's one that doesn't have a removable drive, I bring along my drive as well. Within seconds I am up and running. I no longer need to rely on the software and setup of the service bureau to work the way I choose to work.

On the PC side, things are even better. My hard drive crunch is over (at least for now). My desktop publishing programs and fonts reside on one cartridge. A collection of several dozen back files of correspondence resides on another. I'm considering putting all of my seldom-used programs on a third.

Each new cartridge costs \$70—a damn good price for 40Mb of hard disk space.

Backing up is also a pleasure (remember, that was the original reason I bought the thing). I don't even use my backup software. I simply use XCOPY on the PC, or the Finder on the Mac, to copy 40Mb chunks of information to the cartridge drive.

THINGS TO KNOW BEFORE YOU BUY

There are several other brands of PC SCSI boards. Not all work with all computers, and not all support this particular Syquest mechanism. BMUG is currently adding an AIC SCSI board to the PC that runs its BBS, and it looks like it will be even easier to set up than the Trantor board (same obtuse documentation, but the support person is comfortable with English). In BMUG's case, since they own several SCSI drives for use on their Macs, and since the board will support seven such devices at a time, the BBS will have a flexibility uncommon to other BBSes.

Most PC SCSI board manufacturers are

also coming out with drivers for XENIX. (Beware—not all flavors of UNIX, or of XENIX, support SCSI devices.)

Although the drive works comfortably on either Macs or PCs, the cartridges themselves cannot be used to exchange information between machine types—both computers use entirely different methods of formatting the cartridges, and so far, I have not seen anything that will let me use the same cartridge on either machine without reformatting. The same will hold true for cartridges formatted with DOS versus those formatted by any of the PC varieties of UNIX (once those drivers are available).

Since purchasing my DPI drive I have done some additional research. There appears to be some consensus that not all 44Mb removable drives are equal. The two brands that got consistently good marks for quality, reliability, and ongoing support are the DPI machine that I purchased, and the AIC drives marketed by Western Data Access in Berkeley. The latter are more expensive than the DPI drives. Physically they are also lighter, and may be better at taking abuse. ■

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Buying A PC Clone

Part II: Choosing Features

BY PAUL
HOFFMAN

Last month, you saw how to choose a store from which to buy your clone. "Great," you say, "that's the easy part. How do I decide what I want in my clone? There are so many choices."

This month we'll examine the kinds of choices you have to make when you purchase your clone. After reading this article, you'll be in a good position to decide the CPU you want, as well as how much RAM and how much hard disk you should start with.

A bit of warning is necessary here: the range of answers to the question, "What should my clone have in it?" is mind-boggling. Ask any three experts and they'll give you four answers. You will most likely hear vague non-answers like, "It depends on what you're using it for," and "You need to remember that you will use the computer for many years," and "Always buy the best you can."

When it comes to clones, everyone is an expert, and almost no one is happy with the one that they bought, even if they bought it only a few months ago. The prices in the clone market drop at unequal rates, making any balancing act very temporal.

If you are a fairly experienced user who runs three or more applications all day long, this article isn't for you. Your needs are dictated much more by what those programs need than by what costs what. If you are a "super user" (a weird term, that, with connotations of both the great and the mundane in one person), this article is certainly not for you, because you already have a strong opinion about what you need and how much you can spend on it. This description is for people who know that there is a difference between various CPUs but may not be sure what that difference is, as well as people who know that speed is good but not how the various parts of a PC contribute to the overall speed.

THE BIG QUESTIONS

So, what are you going to use the PC for?

Don't answer yet, because that isn't the whole question. What are you going to use the PC for—for the next two or three years? Yes, that's a much harder question, since you

can probably list the things you think you'll use it for today, but you have little idea of how your job or life is going to change in the next two years. However, planning ahead for new uses is the best way to avoid spending more money too soon for different hardware required for your changing needs.

Most people's first answer to this question is, "word processing." Almost any PC, fast or slow, can run popular word processors like WordPerfect, Word, and DisplayWrite fairly well.

What else? "Maybe a spreadsheet or a database." Will your files be large or small? Will there be many of them, or only a few? These questions affect how much hard disk you will want.

"And desktop publishing sounds interesting." Now you're talking about an application that almost assuredly requires a faster CPU and lots of RAM, and probably a more expensive monitor.

"I'll be using a modem, probably." No sweat—telecommunications can be run just fine on the slowest of PCs.

"And maybe networking." Now you're talking faster CPU and more RAM.

The second big issue to mull over is: how much do you intend to spend?

Well, you probably don't want to spend anything, especially on something that you feel nervous about. But spend you must, and budget you must also.

Before you answer, think about how much you want to spend in total, not just for the computer. If you need a printer, you'll be surprised how much that takes from your total budget. And you *must* take software into account. If you are buying a computer, you must buy copies of all the software you want to use on it. Note that if this is your second computer, you must buy second copies of everything: you cannot legally move the software over from the first computer to the second unless you remove it from the first. Like printers, software can also take a huge bite out of your budget.

The last big question is *how* you plan to learn to use the computer. If you are going to take classes, you must budget for them (as well as for the lost work time). Even if you're

The range of answers to the question, "What should my clone have in it?" is mind-boggling. Ask any three experts and they'll give you four answers.

going to learn from books, you have to allocate about \$100 and many hours: computer books are notoriously expensive and often low-quality.

CHOOSING THE CPU

Here's where the disagreements among "experts" start. There are six different models of Intel CPUs you can choose from: 8088, 8086, 80286, 80386SX, 80386, and 80486. (Some portables also use compatible CPUs made by NEC, the V20 and V30, but these are fairly rare in this country.)

As 1990 draws to a close, it is hard to find any clone stores selling systems based on the 8088 or 8086; that's good, since there is such a small price difference between them and the much more powerful 80286 that it would be wasteful for anyone to buy such a system at this point. The few stores that sell these systems are probably doing so only to clear out old inventory, not because they are doing you any favors.

Of the remaining four CPUs, you can probably immediately write off the 80486, the fastest and most powerful of the lot; it's very expensive and its power is only cost-

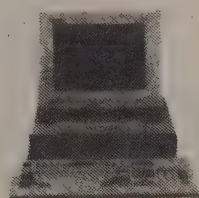


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effective for people running extremely slow programs such as computer-aided design systems. If you are tempted to buy an 80486 just because you always buy the best, it is very likely you'll be throwing away literally thousands of dollars; of course, any clone store would *love* to have you as a customer...

So the main choices these days are 80286, 80386SX, and 80386. If you're only going to use the computer for "light" tasks like word processing, telecommunications, and minor

database work, a fast 80286 will probably be fine for you. The very same system with a standard 80386SX will cost about \$150-\$250 more and give you a speed improvement of about 20%. The 80386SX will also give you the capability of running more advanced software in the future, albeit slowly.

You may have noticed the "fast" and "standard" speed ratings in the last paragraph. Welcome to the confusing world of megahertz, or MHz for short. The faster the CPU,

the faster it works for you, although not always in a direct speedup. Each type of CPU usually comes in more than one speed.

These days, most 80286s you see are either 10 or 12MHz; 80386SX CPUs are usually 16 or 20MHz; 80386es are usually 25 and 33MHz. There is almost no reason to buy a 10MHz 80286, since 12MHz systems usually cost the same or about \$50 more. For a 20% increase in speed, the \$50 is certainly worth it. The other choices are not so easy to make, especially since the speed differences between PCs are impossible to judge based solely on the speed differences of the CPUs.

Unless you're at your last \$200 of computer budget, you're probably better off with the 80386SX over an 80286 since the 80386SX has some capabilities that you may want in the future. For example, if you're going to run Windows software and MS-DOS software at the same time, Windows 3 works much better with an 80386SX (or better) CPU.

If you need more than the low end, your choices are a fast 80386SX, or a standard or fast 80386. The actual speed of these computers has more to do with how well they're designed than on how fast the CPU is. For example, many 25MHz 80386es run faster than some 33MHz 80386es, due to better design of the RAM and hard disk interfaces. Once you're in the higher region of the CPU spectrum, it's more important to compare full speed ratings such as the Norton SI rating or the Landmark speed ratings, flawed as these ratings may be. In general, you will pay \$400-\$750 more for a 33MHz 80386 system than a similarly configured 25MHz system.

HOW MUCH RAM?

The amount of RAM that's standard with a system is mostly based on the way it was designed. 80286 systems come with 512K, 640K, or 1Mb standard; almost all systems with higher-powered CPUs come with 1 or 2Mb standard.

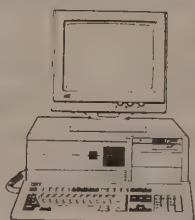
These days, software manufacturers are very sloppy in the way they write programs and thus the programs require more RAM than they used to. Also, MS-DOS takes up more RAM than it used to, and many other utilities that are now practically requirements also take up lots of RAM.

The bottom line is that you probably want a minimum of 1Mb of RAM, even on an 80286 system. If you're going to run more advanced programs or utilities, starting off with 2Mb is a good idea (although certainly not an absolute requirement). If you're going to run Windows software, you should definitely start with 2Mb of RAM; if you're going to run OS/2, you should start with

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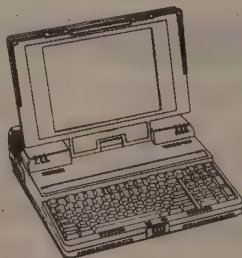
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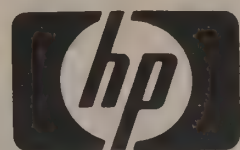
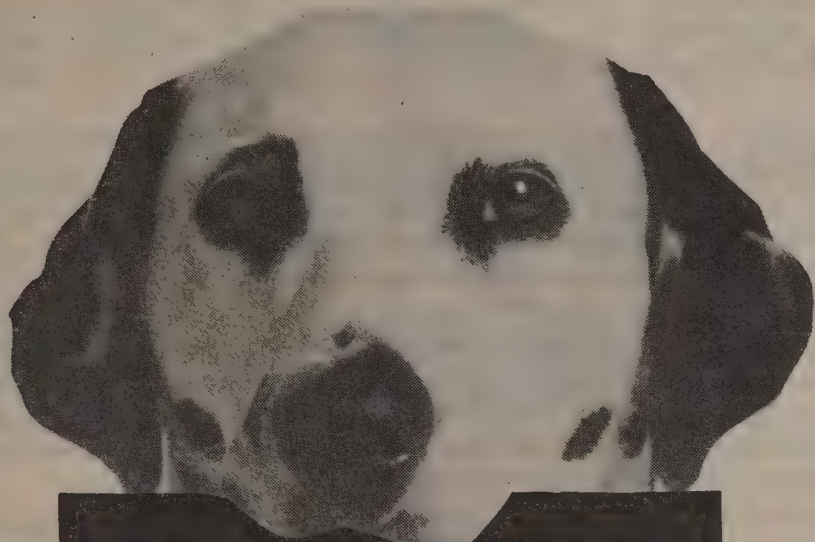
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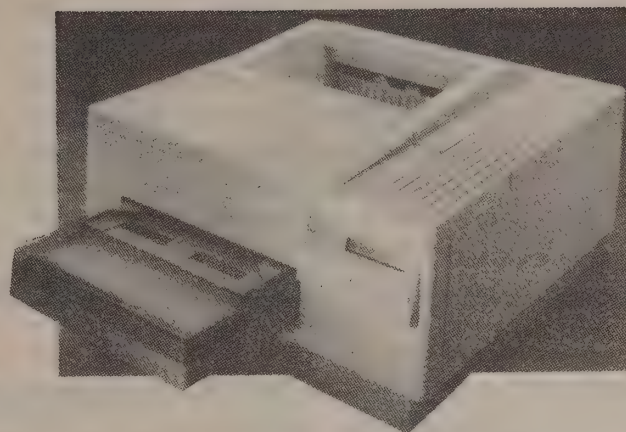


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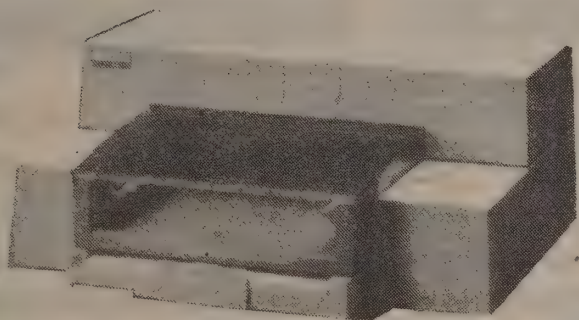
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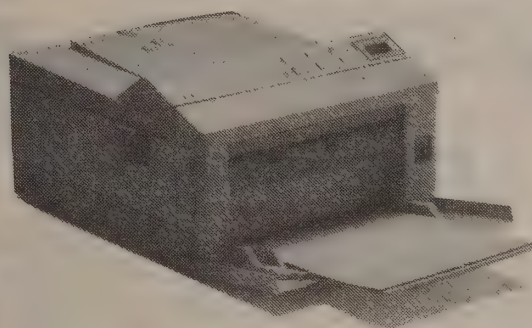
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The main reason that you want to start with sufficient RAM is that, although RAM is easy to buy later if you want more, most people find installing RAM a fairly daunting task. There are two forms of RAM: chips and SIMMs, which are little cards that have the chips already on them. Installing RAM chips is nerve-wracking since it is easy to screw up and permanently damage the chips. Installing SIMMs is much less risky, but you still have to use a lot of force and follow the directions very carefully. For most users, it is a much better idea to start out with more than enough RAM and only buy more when you've outgrown that.

HOW MUCH HARD DISK?

In the PC world, the choices for hard disks are bewildering. Due to the way most PC clones are designed, you have many fewer choices because most systems come with hard disk controllers that only work with one type of hard disk. Of course, you still have to decide how much hard disk you want.

Don't bother with a 20Mb hard disk unless a 40Mb disk costs much more. At most clone

stores, they don't even offer 20Mb disks any more. The average price of adding a 20Mb hard disk to a no-hard-disk system is about \$200; the price of going up to a 40Mb hard disk is only \$100 more.

If you have more than three applications that you intend to use, you will probably run out of space on a 20Mb drive within six months but a 40Mb drive might last you for many years. If you know you will be needing lots of hard disk space, get it with your system. Typical costs of hard disks as part of a new system are about \$200 for the first 20Mb and \$100 for every 20Mb above that (up to around 100Mb).

OTHER ISSUES

No, you're not done yet. You need to choose what kind of video monitor you want.

Most low-end systems are priced as coming with Hercules-compatible monochrome monitor/adaptor combinations. This is fine for most applications, but PC users seem very attracted to color, even though it costs much more and doesn't add much to the computer's ease of use. Substituting VGA, the current standard for color graphics, for low-end

monochrome can cost anywhere from \$350 to \$800. Going for "Super VGA" can go way above that, depending on the quality of the parts.

What else might you have forgotten? A modem (around \$100)? A mouse (\$75-\$125)? MS-DOS (\$60-\$100, if it is not included in the price of the system)? How about California sales tax (probably \$150-\$500)? It all adds up, faster than you might think.

A final note of warning: after you buy your system and start using it, you're likely to fall prey to a common disease that might be called "I-paid-too-much dread." You will notice ads for similar systems at other stores that cost hundreds of dollars less than you paid. Maybe your clone store drops all its prices, and you could have saved big if you had just waited. Don't worry: prices always drop. Unless you want to wait forever, you had to buy when you bought.

If it makes you feel any better, high-end PC users suffer from I-paid-too-much dread more than novices—their systems often cost twice as much as yours so they get it twice as bad. Enjoy your PC and make the most of it now that you don't have to make any more choices about what to buy. ■

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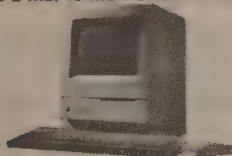
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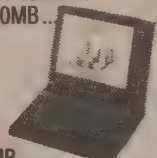
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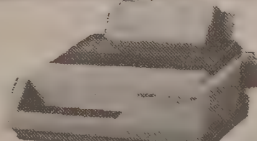
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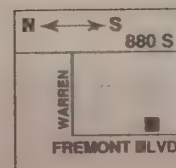
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Prodigy: Where Is It Going?

National Rollout And User Protest Raise Questions About The Future Of Online Communications

BY ADAM GAFFIN

The story is bizarre but true, Herb Rothman swears. Prodigy, the IBM-Sears joint venture, wouldn't let a man post a message in a coin-collecting forum that he was looking for a particular Roosevelt dime for his collection. Curious, the man called "member services." The representative told him the message violated a Prodigy rule against mentioning another user in a public message. "What user?" the man asked. "Roosevelt Dime," the rep replied. "That's not a person!" the man said. "Yes he is, he's a halfback for the Chicago Bears!" the rep shot back.

Rothman, a New Yorker who was one of the first to sign up for Prodigy when it was introduced in 1988, was one of the first to get kicked off this past fall as an organizer of a protest against new email charges that began January 1. Prodigy households now have to pay 25¢ for every message they send over a monthly free quota of thirty.

Leaders of the Cooperative Defense Committee—the first nationwide protest organized largely online—have focused on issues of censorship and alleged bait-and-switch advertising: even after Prodigy announced the new charges, it continued to advertise as a flat-rate service. The Texas State Attorney General's office began an investigation in November to determine whether the ads were deceptive. (At press time Prodigy, while admitting no wrongdoing, had agreed to refund charges to Texas subscribers who signed up between September 6 and December 7 of last year, reimburse the state of Texas for investigative costs, and allow Texas users who had signed up during the period in question to cancel their accounts for full refunds.)

PRODIGY: A DIFFERENT VISION

But the protest has also focused attention on Prodigy's vision of online communications, which is far different from that seen by other national online services, let alone local bulletin-board systems.

It's a vision of online communications as computer home-shopping network.

Where others see a new way for people to

communicate and even create "virtual communities," Prodigy sees vast potential profits from people shopping through its keyboards.

"We are an information service," Prodigy spokesman Steve Hein says. "We are not an email service."

Although other national services have "malls" and advertising, only Prodigy puts ads on almost every screen a user sees. Advertisers pay Prodigy between \$10,000 and \$20,000 to design these ads and their user interfaces.

In press handouts, Prodigy does not even mention its public "bulletin boards" as a feature, pointing instead to things such as "news and stock quotes, home shopping and banking, airline ticketing, stock trading and our new encyclopedia, movie guide and travel guide."

Prodigy says its pricing—\$12.95 a month for unlimited non-email use—is based on the premise that people will use it for shopping.

"Every time you use the service to buy a holiday gift, book an airline ticket, pay a bill, trade a stock, send flowers or buy stamps, you

are helping to assure the continuation of a flat, unmetered fee," because advertisers pay a fee for each purchase and inquiry, Prodigy said in a recent message to users.

"Shopping has been growing more than the bulletin boards," Hein says. He was unable, however, to provide specific figures showing how much use each function now gets.

Hein says Prodigy decided to start charging for email because 20% of the users were sending 90% of the email messages, costing the company millions of dollars for extra computer equipment and workers to manage a mail flow growing 20% a month. When Prodigy started, he said, officials figured households would use email like long-distance phone calls: they would only send several messages a month.

THE EMAIL EXPLOSION

But much of Prodigy's unexpected email traffic is due to the way it runs its public conferences. Unlike other services, which rely

Where others see a new way for people to communicate and even create "virtual communities," Prodigy sees vast potential profits from people shopping through their keyboards. "We are an information service," Prodigy spokesman Steve Hein says. "We are not an email service."

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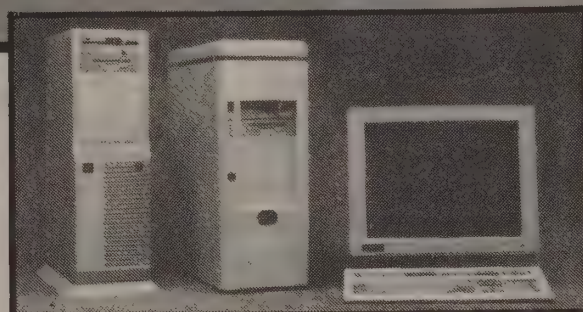
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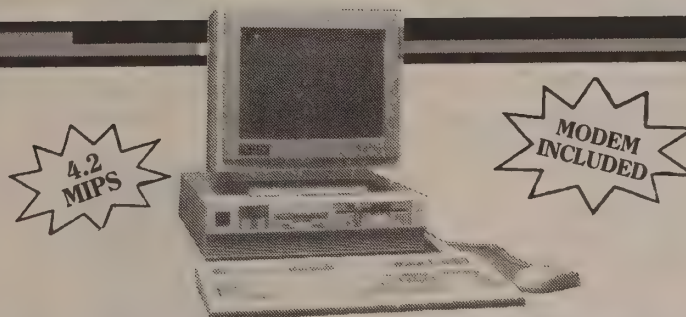


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on the maturity of users and only rarely delete public messages, Prodigy employs several dozen "editors" to screen every potential public message—sometimes delaying their posting by up to forty hours, when they are posted at all.

According to the Prodigy user agreement: "Prodigy reserves the right to review and edit any material submitted for display or placed on the Prodigy service, excluding private electronic messages, and may refuse to display or may remove from the service, any

material that it, in its sole discretion, believes violates this Agreement, is detrimental to other Members or to the business interests of Prodigy, its Members or information providers or is otherwise objectionable."

The agreement also forbids members from attempting to buy or sell any products without Prodigy's prior written consent. Then it adds, "Prodigy reserves the right, without liability, to remove and not to display, any material at the sole discretion of Prodigy. All material submitted to a public postings area

will be automatically deleted according to criteria established by Prodigy."

Prodigy has software that scans incoming public messages for certain objectionable words before it gets to the "editors," but some members complain this is not always perfect: for example, people with an interest in botany claim they cannot hold a public discussion about pussywillows.

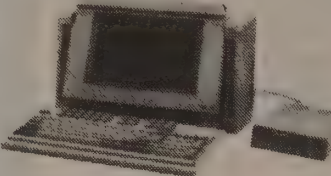
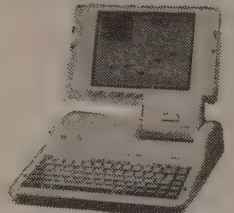
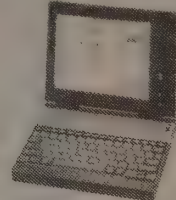
In December 1989, Prodigy simply eliminated an entire mental-health bulletin board when gays and fundamentalists got into a heated debate. Prodigy spokesman Brian Ek compares the network to the pub-

In press handouts, Prodigy does not even mention its public "bulletin boards" as a feature, pointing instead to things such as "news and stock quotes, home shopping and banking, airline ticketing, stock trading and our new encyclopedia, movie guide and travel guide."

lisher of a family newspaper that has a right to decide what is appropriate. Prodigy has no restricted areas, and has to be concerned about what children might see when they log on, he says.

So pet owners were not allowed to use the word "bitch" in discussions about dogs. Coin and stamp collectors could not post lists of items they had for swapping, because Prodigy saw that as commercial activity.

Yet users complained that even this was done capriciously. Rothman says that if one of his messages was rejected, he would resubmit it a few times—and often it would

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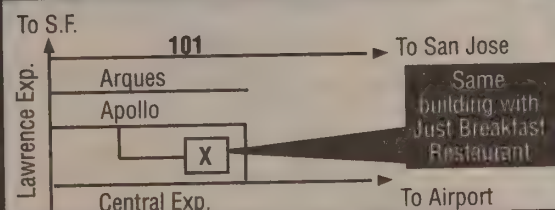


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eventually get in.

In October, one member asked in the "About Prodigy" bulletin board why she was not allowed to comment about the use of the phrase "Queen Bitch" by a character on *L.A. Law*. A Prodigy official responded that Prodigy has different standards for propriety than television. But he said the subscriber could use asterisks. If she were to write "Queen B****," then "adults will get the idea but the actual words will not appear."

THE EMAIL DISCUSSION GROUP

Just a few months after Prodigy went online, some users had turned to email for uncensored discussions.

Rothman says that in late 1988, he had had enough of having his messages about glass-object collecting rejected, so he asked Kim Hazlerig, a Prodigy member-services employee, if there were any alternatives. He says she suggested he set up a "mailing list" via email and that he contact a Los Angeles subscriber who had written software to send large numbers of email messages at once.

Rothman began sending out a weekly newsletter on collectibles. By the time he was kicked off the system, he had 1,500 readers.

Solon Owens, a former Berkeley resident now living in Oregon, was an active participant in Prodigy's mental-health forum, where he and others discussed their progress in 12-step programs such as Alcoholics Anonymous. After the conference was eliminated, he started his own mailing list of ten people—which eventually grew to 120.

The number of these email lists exploded. Soon dozens of groups were using email mailing lists, typically sent on a weekly basis.

Hein says he is unaware of anybody at Prodigy actually promoting email lists or telling people how to start them. For a while, however, the coordinators of these lists were allowed to advertise them in a public forum on the service twice a month.

But with the new email charges, all this ended. Besides Owens's group, a number of handicapped people had set up their own mailing lists. Owens says he could not afford to send out messages to the 120 people now on his mailing list, so he has moved over to GENie. "We cannot afford to provide free services for the handicapped anymore than the Post Office can," Hein says, adding the handicapped would likely see many of Prodigy's shopping services as a benefit worth keeping.

Told that some users feel Prodigy brought

much of the email costs on itself through censorship, Hein says there was a very small group of users who sent out as many as ten thousand email messages a month. "If people hadn't been sending tens of thousands of messages a month, this wouldn't be a problem."

The dissenters claim twenty thousand supporting users. But Prodigy claims that is still just a small percentage of its subscribers. Hein says the network now has more than four hundred thousand households online. He acknowledges that the figure includes people using free signup kits, but said those people make up only a small percentage. Prodigy, like other online services, has never had its subscriber numbers audited.

Not all users objected to the email charges or the way Prodigy runs its public forums. "If they dislike Prodigy so much, why do they have it?" Jan Salamone of Hull, MA asked of the protesters. Salamone likes Prodigy so much she not only wrote them a congratulatory letter but let the service reprint it in its member newsletter.

Henry Niman, a University of Pittsburgh researcher who was kicked offline, said he does like Prodigy—he even persuaded several friends and colleagues to sign up. He said his motive in protesting the email rates was to try to keep Prodigy a good system.

Without naming anyone, Prodigy officials have charged that Niman and the others are really a small band of "hackers" who used devious software to flood the mailboxes of other users and advertisers with increasingly nasty harangues. In November, it posted new regulations forbidding the use of "automatic" mail forwarders and barring users from contacting advertisers online except to make orders or inquire about orders.

Niman says he compiled a list of about nine hundred people interested in the email issue by using Prodigy's own membership-list function, which lets one search for members by city and state, and that he and others simply collected the addresses of advertisers from their email responses.

Penny Hay, a Los Angeles artist whose account was terminated, says the committee was careful to delete the names of anybody who objected to the messages.

IMPACT

Whether the email protest—which has garnered considerable bad press for Prodigy—has hurt it is an open question.

Prodigy's Brian Ek says the service contin-

ues to add thousands of new members monthly. Gary Arlen, who writes a newsletter about online services, calls the protest a "tempest in a teapot" and says the real question is whether Prodigy can ever recoup the several hundred million dollars Sears and IBM reportedly poured into it.

But GENie, a competing system that introduced a flat rate on nights and weekends for several dozen services—including email—just as Prodigy was announcing its price hike, says it has picked up several thousand disgruntled Prodigy users and now has a "Prodigy Refugees" forum. [see sidebar]

Advertisers on Prodigy are also mixed.

"We've had a very good response in spite of the boycott," Jeanine Sek, in charge of the Prodigy account for Hammacher Schlemmer in Chicago, says, adding she quickly grew annoyed with protest messages coming into the company's electronic mailbox. Sek says she would come in some Monday mornings and find forty protest messages in the company's mailbox, all of which took time to deal with.

Sek says she agrees with Prodigy that a handful of "hackers" were abusing email. "They know what they're doing, or, at least, I hope they know what they're doing," she says of Prodigy. She adds that she has been pleased with the response the company has received in its first year on Prodigy. "We're very happy with it," she said.

Chuck Billows, comptroller for H.G. Daniels, an art and drafting supply store in Los Angeles, agrees that answering protest messages "has been a tremendous drain on resources" for his company.

But, he adds, the protest "has cost Prodigy a lot of members and customers, and possibly us a lot of sales.... I think Christmas shopping on Prodigy is under what we had expected."

Billow says he does not see anything wrong with charging heavy email users more, but said Prodigy botched the announcement and should have offered a second, higher flat rate for such people, rather than refusing all attempts at compromise.

"I think, at best, it wasn't properly presented to their members," he says, adding that both sides quickly hardened into absolute positions. The protesters demanded "Unlimited email or else," he says, while Prodigy responded with "Well, the hell with you; this is our business and we can do what we want."

"I think there's been a lot of time and money wasted" by both sides, he adds. ■

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CASH PRICES

From Boardwatch Magazine— Is Prodigy's Loss GEnie's Gain?

BY JACK
RICKARD

Prodigy Services Company has been gaining a bit of attention recently with some fairly dramatic changes to its service. The most positive among them is a new software package for accessing the service. The package makes the service faster in operation than previous versions and perhaps a bit prettier.

Prodigy has made significant inroads in the home videotext market by providing local dial-up service at a flat rate of \$9.95 per month during 1990. The service makes most of its income from acting as an online mall. The service makes approximately 10% on all online sales.

The company has also recently announced an alliance with BT Tymnet to allow over three hundred communities local access to the service. Tymnet is a packet switching service that typically charges an hourly rate for connections between US cities. The question of the hour seems to be: How can Prodigy retain its \$9.95 monthly fee for unlimited service while still carrying three hundred cities on a clocked network such as Tymnet? The answer would appear to be, at least partially, that they can't. The service has announced a 30% rate increase effective January 1 to \$12.95 per month, and is currently blanketing the country with direct mail pieces introducing the service at \$12.95 with no mention of the previous rate.

Another factor causes some confusion. The company recently announced it had topped five hundred thousand users. A closer look, however, reveals a probable total of about 250,000 or fewer actual accounts, and less than that actually paying a bill. The company steadfastly refuses audit and counts all subscriber family members (up to six per account) as "users." By contrast, GEnie claims 209,000 users and CompuServe is currently claiming nearly six hundred thousand users. These counts are based on access accounts. They make no claims to how many family members may be using the same account. Still, Prodigy has to be considered one of the fastest growing services in the country.

All is not well with Prodigy in other ways. The company recently dropped its toll-free help line. And several rumors are making the rounds regarding Sears Roebuck and Company's dissatisfaction with the service. Sears has been pressuring the service to turn a profit and may be looking to bail out of the partnership; some reports indicate Sears has discussed selling its interest to British Telecommunications plc, operator of Dialcom. In any event, the Sears catalog, which had been exclusive to Prodigy, is now appearing on both CompuServe and GEnie as well.

Meanwhile, GEnie has introduced some dramatic cuts in its pricing with a new \$4.95 flat-rate monthly fee. It has also dropped its \$29.95 sign-up fee entirely. At this point, you can sign up for the service simply by paying the first month's \$4.95. The skeptical will immediately question the move, since not all services are available under the flat rate. However, a careful analysis reveals that by far the majority of the actual services are indeed included under the plan. You can dial the service, check and send email, access virtually all news functions and most of the roundtable discussions, check closing stock quotes, view most of the educational resource elements, and of course all of the online purchase (mall) items under the program.

In essence, anything you can do on Prodigy, you can do on GEnie as well, but at less than half the cost. The items not falling under the flat rate plan tend to be those unavailable on Prodigy at any price—software uploads/downloads, online chat, multiplayer real-time games, and a handful of special database services that were surcharged before anyway. Even the online connect time for software/chat/multiplayer games has dropped dramatically for the vast majority of 2400 bps users. The hourly rate for 2400 bps users was cut from \$10 down to \$6 an hour. While Prodigy is raising its prices by 30%, GEnie is cutting its by 40%. Is this some industry or what?

One of the reasons GEnie can do this is that it owns its own packet network—available as a local call from over five hundred cities. Another element to consider: CompuServe claims nearly six hundred thousand users and GEnie claims over two hundred thousand. One problem with their numbers is that many individuals, due to various free-time promotions, have several accounts on the system. Once the free time is consumed, they rarely use the extra accounts. Further, many individuals don't use their accounts at all—perhaps logging on for a few minutes once every two or three months.

When CompuServe bought the Source service in 1989, the main thing it actually got was a list of fifty-five thousand users accustomed to receiving a \$10 monthly charge whether they dialed in or not. CompuServe liked this so much it shortly thereafter instituted a \$1.50 monthly charge of its own. This works like magic to raise revenues from dormant accounts. All these services are automatically charged to credit cards anyway. A \$1.50 per month charge is not enough to scream about if you do use the service occasionally, and most will go along with the program, knowingly or not. If two hundred thousand accounts aren't used that month, there is still \$300,000 coming in to help track their dormant accounts.

At \$4.95 monthly, GEnie quite likely will garner enough money from dormants to cover the actual costs of the flat-rate users quite nicely. In effect, it has dramatically lowered the costs for those that actively use its service by significantly increasing the costs for those who don't actively use it.

Although GEnie does present a rather plain interface, it has grown well in the past few years based on a low access price coupled with a competitive array of services. The ALLADIN access program is not the best in the business but does offer some enhancement. But at \$4.95 per month and \$6.00 hourly for clock intensive services such as chat and downloads, GEnie begins to look competitive even to local BBS services in price, while offering national scope and access. And it puts Prodigy and CompuServe to bed by offering a combination of the strong points of each service (Prodigy's flat rate and CompuServe's software downloads/chat) at a price dramatically lower than either service.

Our read of comments on BBSeS across the country is that the real online aficionados are genuinely impressed with GEnie's new efforts. The move seems to be the subject of a large number of online conversations these days, and GEnie seems to have garnered a great deal of favorable attention by the move.

GEnie is making some other attractive motions toward success. The commercial email component of its network, GEIS-COM, is adding 9600 bps V.32 connections in forty cities. Availability for GEnie users can't be far behind. It is aggressively pursuing international connections. Japan's PC-VAN network is now directly accessible by GEnie callers—albeit at a surcharge—and this month it has extended connections into East Germany and added a German roundtable to its repertoire. The East Berlin connection allows callers there to tap into GEnie via a local call. The company plans ports in Dresden, Leipzig, and Chemnitz before the end of the year.

Clearly, the trend in commercial services is toward better service at least expense. And GEnie in particular seems to be aggressively seeking a dominant marketing position. If it should for some reason decide to implement a somewhat standard graphics interface that the rest of the world could share in (might we suggest NAPLPS?), it very likely could wind up being the dominant service within a short period of time. (GE Information Services, 401 N. Washington St., Rockville, MD 20950; 800/638-9636.) ■

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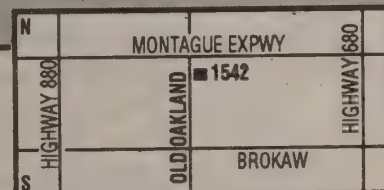
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When Worlds Collide

Scenes From The Japan Press Tour

BY MARY EISENHART

Last spring I got a phone call from Joel Strasser at Dorf & Stanton, a PR agency in New York. Do I want to go on a Maxell press tour of Japan?

True to our cultural roots in the rock 'n' roll business, I said, "Maxell? Don't you want the BAM guys?"

No, no, says Joel. Maxell diskettes. Maxell optical storage. Computer stuff. They're putting together the first-ever tour of their factories, and wouldn't I like to check it out?

And so I found myself with a bunch of other jet-lagged editors in another world for a whirlwind look at Japanese high tech. It was informative, bewildering, and unforgettable—and punctuated with surreal experiences, not the least of which was running into Dvorak in the middle of Tokyo.

Several months later, having scored a copy of KanjiTalk from Apple, I am studying Japanese. But that's another story. Meanwhile, here's a look at some things we haven't seen yet.

TRADE SHOW: ON BEYOND COMDEX

One day of the tour was devoted to the International Business Show in the Harumi section of Tokyo. Much has been written about gridlock at COMDEX, but probably not by people who attend this multi-building extravaganza that features everything from office furniture and promotional doodads (very important in Japan's gift-oriented culture) to workstations.

Japanese trade show culture seems to be a little different. For one thing, there are no booth bimbos. Instead, there are small armies of smiling, bowing, uniformed young girls proffering handouts and giving canned speeches—in complete disregard of the equally loud presentation from the booth next door.

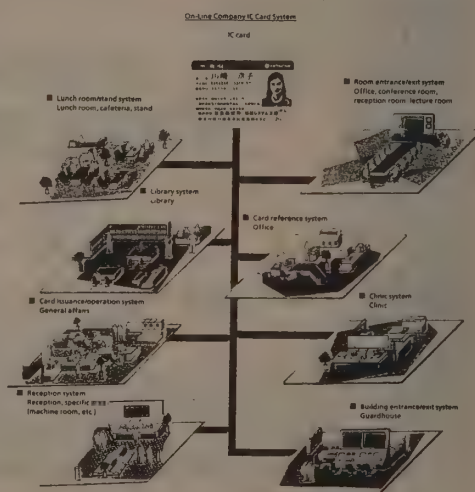


For the ultimate in employee data tracking, Hitachi uses an IC-card-based system.

There's also the fact that vendors who are deadly rivals in the US often have the same marketing partner in Japan, so, for instance, NeXT and Apple were eyeing each other rather nervously in the Canon booth. Company presentations seem to be based on somewhat different principles from the US version—the Microsoft booth, for instance, featured multiple running-water fountains and white flamingoes, and one enterprising company had imported a platoon of blond American cheerleaders to endorse its product.

The Mixed Messages Award goes to the company that was proudly showing the latest generation in automated paper shredders—right next to a 700-year-old bonsai tree.

While US companies would encounter no end of flak for marketing anything as a



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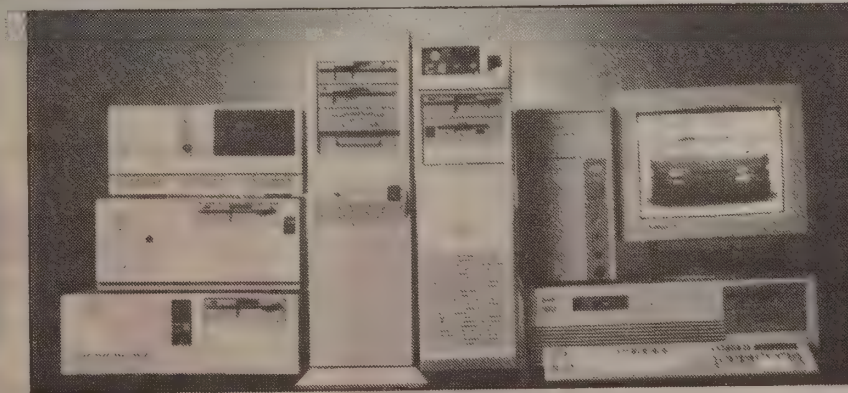
Novell, Gateway, Western,	
SMC, SCO, Protean,	
Aquila, 3Com, Synoptics	

SOFTWARE

ELS Level 1/2	CALL
Netware 2.15	CALL
Xenix, Unix	CALL

• SCANNERS & DIGITIZERS

Sharp	CALL
Chinon DS3000	CALL
Mitsubishi	CALL
Kurta 12x12 w/Pen	\$365
SummaGraphics 12x12	CALL
Hitachipuma	\$355
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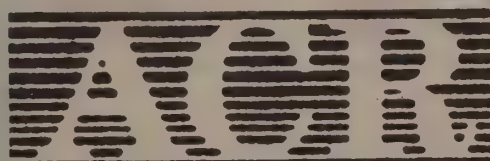


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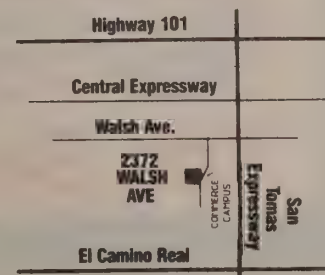
Mon-Fri: 9-6PM
Sat: 10AM-5PM



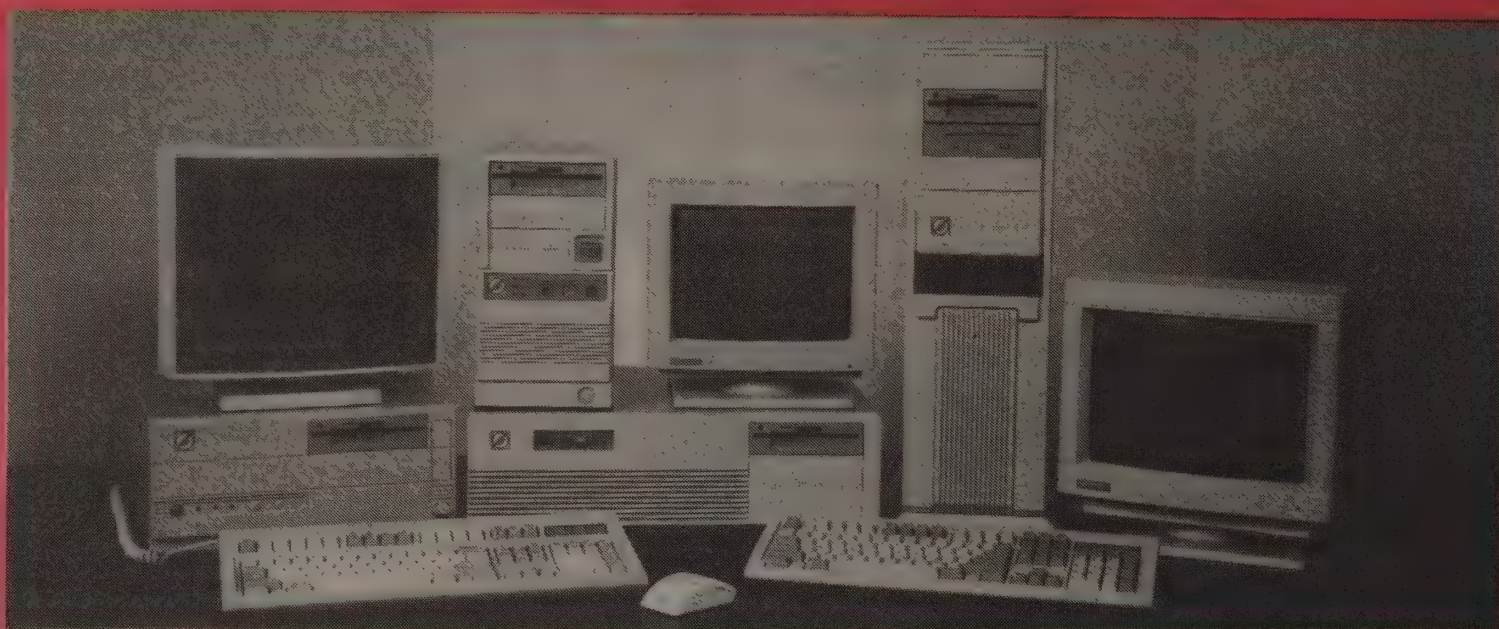
SYSTEMS

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Santa Clara, CA

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One Year Limited Warranty
Prices Subject To Change W/O Notice



Precision



Precision 286-12

WITH 40 MB & MONO SYSTEM

- . Highest performance true zero wait state running at 12Mhz (Landmark = 16.1Mhz)
- . 1MB DRAM memory included.
- . Small foot-print AT case w/ 200W power supply.
- . IDE (Integrated/Embedded) dual hard/floppy controller.
- . 1.2MB high density floppy drive & **40MB** (28ms) IDE hard disk drive.
- . High quality mechanical keyswitch, tactile click 101 key keyboard.
- . High resolution **Monochrome** graphics card with parallel printer port.
- . High resolution **Monochrome** graphics monitor.

695

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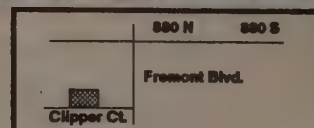
WITH 66 MB & VGA SYSTEM

- . Highest performance true zero wait state running at 16Mhz (Landmark = 21.0Mhz.)
- . 1MB DRAM memory included.
- . Small foot-print AT case w/ 200W power supply.
- . RLL (Run Length Limited) dual hard/floppy controller.
- . 1.2MB high density floppy drive & **66MB** (24ms) RLL hard disk drive.
- . AT I/O card (2 serial, 1 parallel)
- . High quality mechanical keyswitch, tactile click 101 key keyboard.
- . High resolution **VGA** 16 bit graphics card 256KB graphics buffer.
- . High resolution 14" **VGA** graphics monitor.

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Precision 486-25

WITH 4 MB RAM & SUPER VGA SYSTEM

- Highest performance true zero wait state 486 running at 25Mhz (Landmark = 114.0Mhz.)
- Intel 486-25 CPU Ver. B6 with built-in math coprocessor.
- Internal 8KB cache memory upgradable to 128KB & **4MB** DRAM on board.
- Solid built Upright case w/ 250W power supply.
- 1:1 Interleaving MFM dual hard/floppy controller.
- 1.2MB high density floppy drive (1.2MB/360KB compatible.)
- AT I/O card (2 serial, 1 parallel)
- High quality mechanical keyswitch, tactile click 101 key keyboard.
- High resolution **Super VGA** graphics card with 1024X768 resolution.
- High resolution 14" **VGA** 1024X768 graphics monitor.
- Many Hard Disk Options

2395

The Best's Just Got Better.

Precision 386-33

WITH 100 MB & SUPER VGA SYSTEM

- Highest performance true zero wait state running at 33Mhz (Landmark = 55.0Mhz.)
- Two way set associative 64KB cache memory & 1MB DRAM memory included.
- Solid built Upright case w/ 250W power supply.
- IDE (Integrated/Embedded) dual hard/floppy controller.
- 1.2MB high density floppy drive (1.2MB/360KB compatible.)
- **100MB** (18ms) IDE hard disk drive.
- AT I/O card (2 serial, 1 parallel)
- High quality mechanical keyswitch, tactile click 101 key keyboard.
- High resolution **SVGA** 16 bit graphics card 512KB graphics buffer.
- High resolution 14" **SVGA** 1024x768 graphics monitor.

2095

The Best's Just Got Better.

Precision 386-25

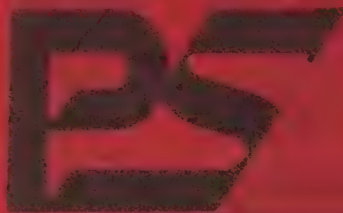
WITH 80 MB & VGA SYSTEM

- Highest performance true zero wait state running at 25Mhz (Landmark = 36.0Mhz.)
- 1MB DRAM memory included.
- Conventional Standard AT case w/ 230W power supply.
- IDE (Integrated/Embedded) dual hard/floppy controller.
- 1.2MB high density floppy drive (1.2MB/360KB compatible.)
- **80MB** (18ms) IDE hard disk drive.
- AT I/O card (2 serial, 1 parallel.)
- High quality mechanical keyswitch, tactile click 101 key keyboard.
- High resolution **VGA** 16 bit graphics card 256KB graphics buffer.
- High resolution 14" **VGA** graphics monitor.

1595

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25MHz 486 0 WS

with 40MB HD

\$1900

- Intel 80486-25 CPU with ON/CHIP 8KB Cache & ON/CHIP NPU
- 2 MB RAM Expandable to 8 MB On-Board
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- 1:1 Interleave Hard/Floppy Disk Controller
- 40 MB IDE Hard Drive
- 2 Serial, 1 Parallel, 1 Game Port
- 101 Key Enhanced Keyboard
- 230W Power Supply & Case Holds 5 Drives
- Real Time Clock/CMOS Memory w/Battery Backup
- Including 80487 Math Coprocessor



33 MHz 386

with 64K Cache w/40MB H/D

\$1475

- Landmark Speed = 56 SI = 41
- 1 MB RAM Expandable to 16 MB; Memory Support Up To 16 MB Total With Optional Memory Board
- Socket for 80387
- 1x32 Bit, 5x16 Bit, 2x8 Bit Slots
- Real Time Clock/CMOS Memory w/Battery Backup
- 1.2 or 1.44 MB Floppy Drive
- 40 MB, 17ms IDE Hard Disk
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 230W P/S System Case Holds 5 Drives
- 101 Key Enhanced Keyboard

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SUPER VGA 1024 x768

28 DPI Plus Super 16-bit VGA Card

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with PS Mouse for

\$89



286 12/16MHz 0 WS

with 40MB H/D, 1 MB RAM

installed, expandable to 4MB

\$650

\$720

- 1.2 or 1.44 MB Floppy Drive
- 40 MB Hard Disk Drive
- 2-Floppy & 2-Hard Disk Controller (1:1)
- 101 Key Enhanced Keyboard
- 200W Power Supply
- 8 Expansion Slots & 80287 Math. Chip Socket
- Standard AT-style cabinet
- Real Time Clock w/Battery Backup



25MHz 386 0 WS

with 40MB H/D

\$1300

- Landmark Speed = 43 SI = 33
- 1MB RAM Expandable to 16 MB; Memory Support Up To 16 MB Total With Optional Memory Board
- Socket for 80387
- 1x32 Bit, 5x16 Bit, 2x8 Bit Slots
- Real Time Clock/CMOS Memory w/Battery Backup
- 1.2 or 1.44 MB Floppy Drive
- 40 MB 17 ms IDE Hard Disk
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 230W P/S System Case Holds 5 Drives
- 101 Key Enhanced Keyboard



16MHz 386SX

0 WS with 40MB H/D

\$975

- Landmark Speed = 22 SI = 21
- 1 MB RAM On Board Expandable to 8 MB
- 1.2 or 1.44 MB Floppy Drive
- 40 MB Hard Disk Drive
- 1:1 Interleave Hard/Floppy Disk Controller
- 2 Serial, 1 Parallel, 1 Game Port
- 101 Key Enhanced Keyboard
- 200W Power Supply & Case Holds 5 Drives
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- Socket For 80387SX

Special

**SAME PRICE For
386-20 MHz Dx Motherboard
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Trade-in your working monochrome monitor and graphics card (\$25 rebate value) our 28 pitch 1024x768 Super VGA monitor and 16 bit WD chip set Super VGA graphics controller card.

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Upgrade AT to 386 DX-20

Trade-in your working AT motherboard for our 20MHz 80386DX motherboard with 1MB of 80ns memory.

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Upgrade AT to DX-25

Trade-in your working AT motherboard for our 25MHz 80386 motherboard, CPU included, with 64KB cache and 1 MB of 80ns memory.

\$650

Upgrade AT to DX-33

Trade-in your working AT motherboard for our 33MHz 80386 motherboard, CPU included, with 64KB cache and 1MB of 80ns memory.

\$985

Upgrade 20MB to 40MB

Trade-in your working 20MB hard drive system, drive and controller, for our 17ms access 40MB IDE hard drive and controller card.

\$220



Upgrade 20MB to 80MB

Trade-in your working 20MB hard drive system, drive and controller, for our 17ms access 80MB IDE hard drive and 1:1 controller card.

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OR

Trade-in your working 20MB MFM drive for our 80 MiniScribe MFM drive.

\$380

Upgrade 20MB to 200MB

Trade-in your working 20MB hard drive system, drive and controller, for our 17ms access 200MB Conner IDE hard drive and controller card.

\$750

- 12" Amber Monitor & MGP Card\$89
- 16 Bit VGA Card 85
- 1.44 MB Floppy Drive (Fujitsu or Teac) 75
- 14" VGA Monitor (640x480) 285
- 2400 B. Modem + 4800 FAX Card 95



Powersource Computer Systems has served the Bay Area for over six years. Our technicians, who have serviced computers for over four years, offer the best in service to our customers. Our systems, assembled of components from OEMS manufacturing for the computer industry for over ten years, provide the best in performance at the best price.

maxell MAXELL EDITORS TOUR '90



Editors Meet Engineers.

"woman's computer," Hitachi was proudly showcasing its Elles machines as exactly that—the promotional video showed the traditional male middle-aged Japanese boss tearing out his little remaining hair until his young, beautiful Office Lady, looking like she stepped out of *Vogue*, solves all his problems with a few keystrokes and a Mona Lisa smile.

There was a lot of neat technology, much of which hasn't reached us yet. Color fax machines of unbelievable brilliance and clarity. The Sony Palmtop, which accepts English and Japanese handwritten input. A VGA flat panel color display, indistinguishable from a "real" monitor, on an unmarked Sharp laptop.

Without a doubt, my most un-American experience occurred at lunch. Dazed from jet lag and Trade Show Hell, burdened with several shopping bags full of handouts in languages we didn't read, we sat on crowded outdoor benches to deal with our boxed lunches. Afterwards, we got up to leave, and had progressed some distance when we heard a great commotion behind us.

Turning around, we found ourselves pursued by a small group of worried-looking Japanese businessmen.

One of them was waving my camera, which I'd left on the bench, and bowing.

FACTORY TOURS

Two days were devoted to factory tours, including the one in Tsukuba

where Maxell makes floppy disks, optical disks, memory chips, and other storage media. Maxell, which started life as a battery manufacturer, is the market-share leader for storage media in Japan, and apparently intends to stay that way—we saw 24-hour-a-day robotized production lines, watched crews checking archival-quality tape for media errors with electron microscopes, and received many lectures on the unending quest for the perfect disk. (Along the way, we encountered the occasional culture shock—for instance, the notion that tape is great for archival storage, but backups? Why backups? Your hard disk isn't supposed to fail, right?)

Probably the single most interesting thing we saw in our factory travels was the new plastic flex shutter Maxell recently introduced for its SuperRD high-density floppies (and eventually, the entire 3 1/2" line). As you may recall, Maxell products, from cassettes on, carry the guarantee that if the product fails, any time, for any reason, you can return it for full replacement. This is more than a clever marketing ploy—it turns out that teams of white-coated engineers who regard disk failure as a matter of personal honor scrutinize all those bad diskettes to figure out what went wrong and how to prevent it.

An overwhelming number of 3 1/2" disk failures, we were told, occur because of the metal shutter. Often the disk gets dropped, the shutter flies off, and that's the end of that. If it manages to survive that hazard, the shutter scrapes plastic dust from the disk casing, the dust falls onto the magnetic media of the disk itself, and your data is slowly abraded away.

So they came up with this plastic shutter. A gleeful engineer (who had previously demonstrated the durability of a 5 1/4" disk by microwaving it and then booting Lotus) dis-

played a guillotine-like device for torture-testing diskettes. A competitor's metal-shutter diskette took the one-meter drop, and the shutter flew across the room. The SuperRD didn't lose its shutter and ran its applications fine.

And, of course, being plastic, it doesn't abrade the disk casing and drop dust on your data, either.

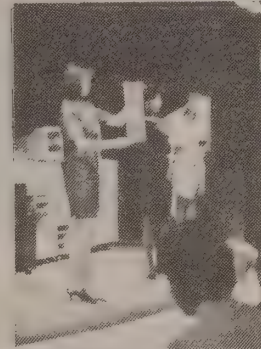
They gave us a box of these diskettes. I brought mine back to the office. While I can attest that they can, with some effort, be made to fail, the biggest hazard seems to be that people walk off with them because they're so cool-looking.

DO YOU KNOW WHERE YOUR EMPLOYEES ARE?

Far more than in the US, the Japanese use magnetic media to store all manner of information—rental cars, for instance, use floppy-based navigation systems and mileage histories, so those microwave-resistant diskettes get put to good use.

Very popular is the IC card, a credit-card-sized piece of plastic with an integrated cir-

PHOTO: MARY EISENHART



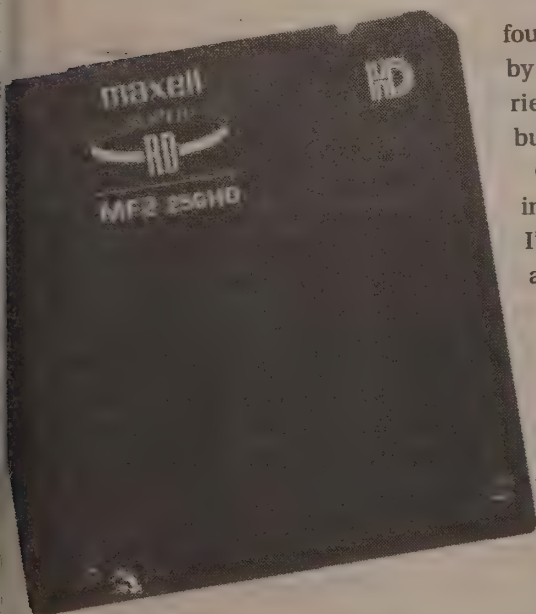
The International Business Show offered differences and similarities to the American trade show circuit.

cuit embedded therein. Banks use them. Businesses use them. And, we discovered, Hitachi is using them for its version of the office of the future.

It's Hitachi System Plaza Shin-Kawasaki, an "intelligent building," with access to all areas and services controlled by IC cards issued to all employees and visitors. Using the same card, the employee buys lunch, does research in the company library, and visits the on-site medical clinic—with records automatically updated on the card, which can contain up to 1.5Mb of information. The card also doubles as an identification badge.

In general, Japanese culture is far more accepting than its American counterpart of surveillance—it's hard to imagine the majority of American workers wanting their complete medical history in the company mainframe, for instance. But, like a lot of technology we saw on this trip, the IC cards are clearly helpful for data management in the US as well as in Japan, though their ultimate uses will probably be dictated by cultural differences as much as raw capability. ■

The new Maxell flex shutter helps prolong disk life.



Uncle Ralph's
PRESENTS

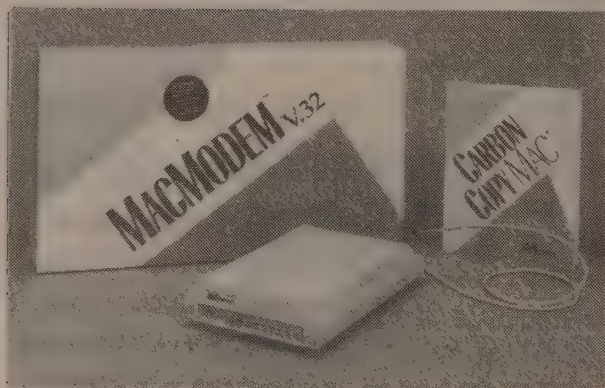
PRODUCT SPOTLIGHT

New Products

MACINTOSH HARDWARE

LOWER COST DATA ON A MAC

MacModem v32 provides lower cost high-speed data transmission for the Macintosh. The MacModem v32 is an MNP 9 modem capable of baud rates up to 38,400 bps. It features a wake-up cable that allows the user to start a

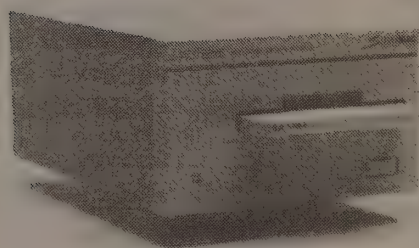


remote Macintosh just by calling the remote modem with any communications software. In addition to data compression capabilities, the MacModem v32 provides error detection and correction. MacModem is sold with two copies of

Carbon Copy Mac, and one copy of Quick Link II. (\$1099) Microcom, Inc., Still River Corp. Center, 55 Federal Rd., Danbury, CT 06810.

SUPER STORAGE FOR GRAPHICS FROM SUPERMAC

LaserFrame, the newest storage system from SuperMac, is designed specifically for graphics professionals. Building on SuperMac's expertise in graphics and storage technologies, LaserFrame combines the infinite capacity of cartridge-based storage with the fastest performance available in optical drive. It provides 650Mb of storage with up to 50% faster read time than competing products. In addition to quick access and enormous storage capacity, LaserFrame's rewritable storage technology is one of the safest methods for storing computer data. Laser beams are used to read, write, and change data on



the disk. Since the media can only be altered through high-temperature heating by a laser beam, the cartridges are safe from the radiation, magnetic fields, and magnetic oxide drop-outs usually experienced with conventional hard or floppy disks. Rated shelf life of each cartridge is ten years, with more than one million rewrites. (\$6499) SuperMac Technologies, Inc., 485 Potrero Ave., Sun-

continued

PRODUCT UPDATES

- **Adobe** has announced the availability of **Adobe Illustrator 3.0**, a new version of its best-selling illustration program for the Macintosh. Customers who purchased Illustrator 88 between July 1, 1990 and October 22, 1990 will receive a free upgrade. Adobe Systems, Inc., 1585 Charleston Rd., PO Box 7900, Mountain View, CA 94039-7900. (415)961-4400.
- **Aladdin Systems** has started shipping **Stuffit Classic v1.6** free to registered users. This \$25 Macintosh utility will compress any file and folder up to 98% (with an average of 50%). Aladdin Systems, Inc., Deer Park Center, Suite 23A-171, Aptos, CA 95003. (408)685-9175, AppleLink: ALADDIN.
- **Aldus** has released **Aldus PageMaker v3.01 for OS/2 Presentation Manager**. Version 3.01 is compatible with OS/2 v1.21 from Microsoft and OS/2 v1.3 from IBM. The update disks will be mailed free to all registered owners of PageMaker 3.0 for OS/2 Presentation Manager. Aldus Corp., 411 First Ave. S., Seattle, WA 98104-2871. (206)628-6594.
- **Automated Training Systems, ATS**, has announced the release of **AS/400 Query for Users for OS/400 Release 3.0**. The updated AS/400 course provides practical training in the use of Query/400. ATS, 21250 California St, Suite 107, Woodland Hills, CA 91637. 1-800-426-8737.
- **Brøderbund Software** has introduced **TypeStyler 1.5** of its Macintosh font manipulation program. New features include advanced shaping options, support for family-built fonts, the ability to specify a type size, and a new SmoothMover utility for managing SmoothFont files. Brøderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101. (415)492-3200.
- **System Sleuth 3.0**, from **Dariana Technology Group**, digs further down into hardware with probes that help ferret out defective memory chips, surface areas gone bad on hard disks, and serial and parallel ports that don't properly channel data. Dariana Technology Group, Inc., 6945 Hermosa Circle, Buena Park, CA 90620. (714)994-7400.
- **Deneba Software** announced a **\$25 rebate** to Mac Classic, LC and IIsi buyers who purchase UltraPaint 1.0 before March 31, 1991. To obtain the rebate users must send proof of purchase, the computer's serial number and UltraPaint registration card to: UltraPaint rebate, Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. (305)594-6965.
- **Hayes** announced local area network support in **Smartcom Exec v2.0**. Registered users of Smartcom Exec will receive the upgrade automatically. Unregistered users will need to request the free upgrade from Hayes Customer Services, Hayes Microcomputer Products, Inc., PO Box 105203, Atlanta, GA 30348. (404)441-1617.
- **Precision Software**, developer of database management systems for PC graphical environments, is now shipping **Superbase 2 v1.2** database manager for Microsoft Windows. Precision Software, Inc., 8404 Sterling St., Suite A, Irving, TX 75063. (214)929-4888.

continued

POWERFUL

UNCLE RALPH'S/OMNITEL 386-33

"This is a fine machine from a store that is setting the standard for retail support and service . . . Given the quality of the components, I consider the prices excellent"

Bernie Zilbergeld, Computer Currents

**33 MHZ WITH CACHE, 100MB CONNER HD,
4MB RAM, SUPER VGA COLOR MONITOR,
2 FLOPPY DRIVES, TAPE BACK-UP**

WHAT IS INCLUDED...

TAPE BACK-UP

Colorado Memory Systems 100MB tape back-up system makes protecting your valuable data easy

VIEWSONIC 1024X768 VGA COLOR MONITOR

This is one of the best monitors available today. Made by Matsushita (the same folks who own Panasonic, JVC, and Technics). It boast an impressive .28 dot pitch, and it looks excellent whether it's on or off.

1024 X 768 VGA CARD

The Viewsonic VGA card comes with 512k RAM for Maximum resolution and choice of colors. Better still, it is non-interlacing to maintain upgradeability.

2 TEAC FLOPPY DRIVES

3.5" 1.44 MB and 5.25" 1.2MB floppy's provide maximum convenience and compatibility.

2 SERIAL PORTS, PARALLEL PORT, & GAME PORT

4 ports connected through only one bus slot to maximize system expandability and connectivity.

100MB CONNER HARD DRIVE

Very fast and so quiet that you'll have to put your ear to the computer to hear it.

YOUR CHOICE OF EXCELLENT KEYBOARDS

Whether you like a "click" keyboard or a "silent" one, function keys on top, or on the side, a large enter key, or a small one, we'll have a keyboard you love, and we'll leave the choice to you.

ONE HOUR REPAIR SERVICE: If you have a problem with one of our computers we can usually have it fixed within 1 hour. It's important to us that our customers remain satisfied.

90-DAY INTEREST-FREE FINANCING: You can defer payment for 90 days and pay no interest at all!



SATISFACTION GUARANTEED

You must be completely satisfied with the speed, software compatibility, integrity of design, workmanship, and overall good looks of this system or we will be delighted to take it back.

486
OMNITEL

**ALL THE SAME FEATURES PLUS
200 MB MAXTOR HD**

\$4,495

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\$3,295
COMPLETE SYSTEM

WHY WE USE THE OMNITEL\USA MOTHERBOARD...

This may be the finest motherboard ever designed, and it is the heart of this great system:

• 4MB RAM UPGRADEABLE TO 32 MB:

Many systems come standard with only one megabyte of RAM, but this system comes standard with four, and while many systems require you to buy a memory expansion card, this one will take 32 MB right on the motherboard.

• 64K STATIC RAM CACHE:

To maximize speed and eliminate "wait states". Omnitel uses 15ns SRAM vs. 25ns or none at all on most other boards.

• PHOENIX BIOS:

For more extensive run time diagnostics, faster boot-up, and greater compatibility with a wide range of hard drives.

• LIFETIME BIOS UPGRADES:

Omnitel will upgrade your bios to the current version for as long as you own your system, and they won't charge you a nickel.

• 32 MB RAM CAPACITY:

There's no need to buy expensive memory expansion cards. All of the memory goes right on the system board.

• 80387 AND WEITEK SUPPORT

• 8 LAYER MOTHERBOARD:

Many 386 computers are made with a 6 layer wet film motherboard and fine line traces. Omnitel's more expensive construction technique uses an 8 layer dry film design and thick 12 mil traces. The result is a more reliable product that is designed to stand up to the strain of years and years of heating and cooling.

**Complete Systems Include QA Plus
Diagnostic Software & MS-DOS**

Uncle Ralph's

Uncle Ralph's

SATISFACTION

"Uncle Ralph's support and service is the best I've seen from any retail store and probably at least the equal of any in the business, retail or mail-order."

Bernie Zilbergeld,
Computer Currents

7 GREAT REASONS TO SHOP AT
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1. Everything's quality-tested by fanatics

We pre-screen everything we sell for compatibility & reliability because we hate problems even more than you do!

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We'll match any local authorized dealer's price! We'll even protect you against lower advertised prices for 30 days after you buy. We deliver on our promise of low prices!

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If your new purchase isn't exactly what you need you can bring it back for a refund, or trade it in for a television, a stereo, or a fax machine! This is Uncle Ralph's, and we must have something you want!

UR/Omnitel 486

**8 MB OF RAM,
200 MB HARD DRIVE,
2 FLOPPY DRIVES,
1024 x 768 VGA MONITOR
AND TAPE BACKUP**

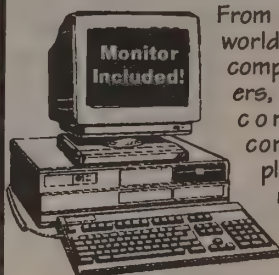
COMPLETE SYSTEM Includes QA Plus Diagnostic Software and MS-DOS

\$4,495

We have the Fastest Computer Service Department in the West and On Site Service is Available

DTK 286 COMPUTER

COMPLETE WITH 40 MB HARD DRIVE & MONITOR

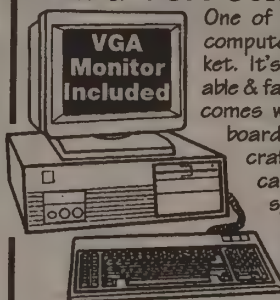


From one of the world's largest computer makers, this IBM compatible comes complete with serial and parallel ports, 1.2 MB floppy drive, 1 MB RAM, 40 mb hard drive, MS-DOS, Hi-res monitor. Includes 1 year warranty.

COMPLETE SYSTEM **\$999**
READY TO GO \$50/Month

UR/Mylex 386-SX

42 MB HARD DRIVE, 3.5" & 5.25" FLOPPY DRIVES, 2 MB RAM & VGA COLOR MONITOR



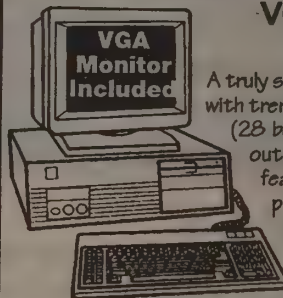
One of the best made computers on the market. It's has a dependable & fast motherboard, comes with a great keyboard, and a superbly crafted "accu-fit" case. Complete system includes parallel and serial ports, 2 MB RAM, 1.2 MB floppy drive,

fast 42 MB hard drive, VGA color monitor, and Uncle Ralph's excellent support and service.

COMPLETE SYSTEM **\$1,699**
INCLUDES QA PLUS & DOS \$80/Month

UR/Omnitel 386-SX20

64K STATIC RAM CACHE, 4 MB RAM, 42MB HARD DRIVE & VGA COLOR MONITOR



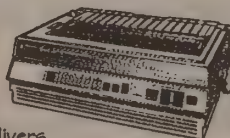
A truly superb computer with tremendous speed (28 benchmark) and outstanding new features. Complete with game, parallel, and 2 serial ports. This outstanding computer is housed in a small footprint case, and offers your choice of excellent keyboards.

Complete System **\$1,999**
Includes QA Plus Diagnostic Software & DOS \$100 Month

PRINTERS FOR EVERY JOB

PANASONIC'S OUTSTANDING NEAR LETTER QUALITY PRINTER

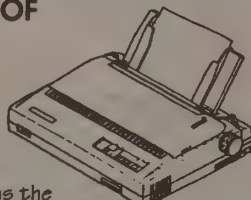
Here's a great buy on our most popular printer. Delivers excellent "near letter quality" print, and zooms along at 192 cps in the draft mode. Includes automatic tractor feed with paper parking and self loading.



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This terrific printer is not only quiet and easy to use, but it's very fast (250 cps) and has the best looking output of any printer in its class.



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Our fastest dot matrix printer produces text and graphics that are good enough for desk top publishers. It's very fast (370 cps) easy to use, & perfect for high output users.



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brother

BROTHER'S 360 CPS, WIDE CARRIAGE PRINTER EXTRA STEADY TRACTOR FEED

If you need a printer with a beefy tractor feed that is practically "jam-proof", you'll love this Brother. It's fast, relatively quiet, and very easy to use. Comes with excellent letter quality & near letter quality fonts.



\$499

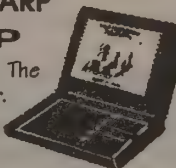
\$35/Month

brother

LAPTOP COMPUTERS

IT'S HERE! THE 4 LB 286 LAPTOP FROM SHARP

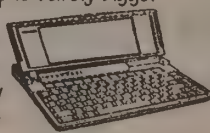
SHARP
It's finally here. The 4.4 lb wonder. Sharp's new 8 1/2" x 11" notebook computer. 286 power, a phenomenal backlit VGA screen, 20mb hard drive, and a ton of personality!



GUARANTEED LOWEST PRICE!

PANASONIC'S WONDERFUL NOTEBOOK COMPUTER

This tiny laptop is barely bigger than a notebook, but it's fast, fun, and has a new easy to read backlit screen. Includes 640k/RAM, AC adaptor and battery charger, and DOS.



Panasonic

Call for Best Price

BONDWELL 286 NOTEBOOK WITH 40 MB HARD DRIVE

Light and Powerful
Here's a terrific buy! It weighs only 7 pounds, has a backlit screen, and 40 MB hard drive, and comes complete with an "extra" battery and external charger.



\$1,299

\$65 Month

ALTIMA II LAPTOP COMPUTER Mercedes Benz of Laptops

Here's one of the most wonderful laptops ever! It has a removable keyboard with a standard enhanced key layout. The VGA screen is bright and razor sharp. 2400B modem, 40MB hard drive, mouse and case come standard.

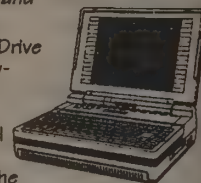


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ALTIMA I \$1,499
ALTIMA II \$1,799

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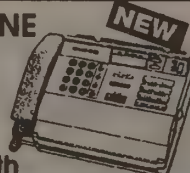
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SHARP'S NEWEST FAX MACHINE

Features, Halftones, 10 page document feeder, Phone/fax switch, and answering machine hook-up.

WORKS WITH YOUR ANSWERING MACHINE!

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\$25 Month



SHARP FAX WITH PAPER-CUTTER, AND 12 PAGE MEMORY

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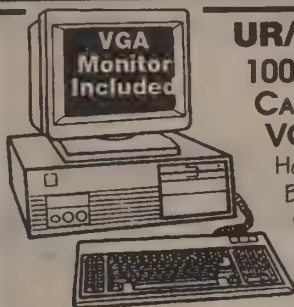
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100MB HARD DRIVE, 64K STATIC RAM
CACHE, 4MB RAM, 2 FLOPPY DRIVES,
VGA COLOR MONITOR

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Complete System Includes QA Plus Diagnostic Software & DOS

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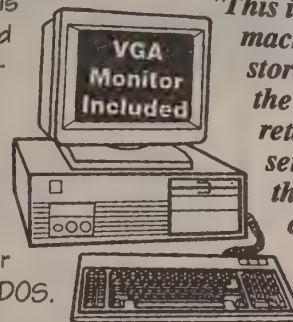
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The OmniTel motherboard is making some big waves lately and we've packaged it with other excellent components to create a high performance system. Complete system includes hard drive, Viewperfect monitor, 512K VGA card, 100 MB tape backup, parallel, game, 2 serial ports, your choice of excellent keyboards, & DOS.

"Super Find" S.F. Focus Magazine

COMPLETE SYSTEM INCLUDES QA PLUS DIAGNOSTIC SOFTWARE & MS-DOS



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Bernie Zilbergeld
Computer Currents

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\$165 Month

LASER PRINTERS and ACCESSORIES

EVEREX 6 PAGE/MINUTE DESKTOP LASER PRINTER

Super-Fast, Very Sharp and Very Clean

Quiet, small-footprint desktop printer with 24 resident fonts and 132 HP-compatible Bitstream softfonts. 300 dpi, 512K memory, expandable to 4.5MB. HP emulation and 2 cartridge slots.

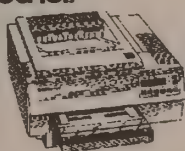


\$999 \$50 Month

BROTHER'S TOP RATED LASER PRINTER

brother

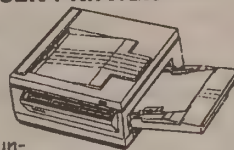
This terrific laser printer has collected Editor's Choice awards from virtually all major computer mags. It runs on the reliable Canon engine, has eight major emulations including HP Laserjet II and HPGL, includes 44 resident fonts, enough memory to do full page graphics straight out of the box, and a super sharp image.



\$1,299
\$65/Month

SUPER-FAST EVEREX/ABATON POSTSCRIPT LASER PRINTER

This new introduction from Everex may be the best Postscript buy to date. Scales text fonts and graphics to any size with unusually sharp image, and unlike most postscript printers it's very fast.



— PC & Mac — **\$1,799**
— EVEREX — \$94/Month

EVEREX/ABATON FLATBED SCANNER

Here's a terrific flatbed scanner with the superb clarity of 256 levels of true gray-scale scanning. Handles up to 8-1/2" x 14" images! For PC, PS/2, Mac and NeXT systems.

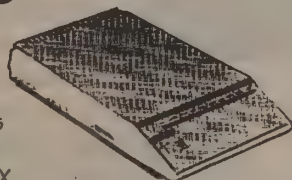


\$1199
\$60 Month

MODEMS

EVEREX 9600 BAUD FAX MODEM

Internal FAX board combined with 2400 baud MNP5 modem gives your computer complete sending and receiving FAX capabilities. Fast 9600 baud transmission rate, G3 compatibility.



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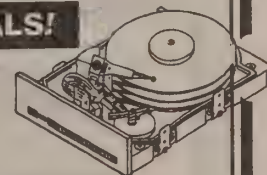
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PRODUCT SPOTLIGHT

nyvale, CA 94086. (408)245-2202.

LARGE SCREEN DISPLAY FOR CLASSIC FROM MIRROR TECHNOLOGIES

Although the Mac Classic was designed with no expansion slots, Mirror Technologies wasted no time in introducing a large screen video display for the Classic. Mirror

developed an internal video board that supports its PixelView single or dual page monochrome displays. To develop an internal board without an expansion, it designed a connector that allows its video board to be attached to the 68000 processor on the Classic. PixelView I is a 15" full page display with a screen refresh rate of 75Hz and a screen resolution of 640 x 870.

PixelView II is a 19" dual page display with a screen refresh rate of 78Hz and resolution of 1024 x 768. (PixelView I is \$567 and the PixelView II is \$897) Mirror Technologies, Inc., 2644 Patton Rd., Roseville, MN 55113. (612)633-4450.

C-CUBE COMPRESSION WORKSHOP

The C-Cube Microsystems Compression Workshop JPEG

software package is a complete set of tools to compress and decompress 24-bit color and 8-bit grayscale digital images using the algorithm proposed by the Joint Photographic Experts Group (JPEG), an ISO/CCITT committee. The Compression Workshop runs on Mac II computers. With these tools, you can reduce the storage required to handle full-color and grayscale images. Compression ratios are adjustable and can range from 8:1 to as high as 100:1. C-Cube Microsystems,

Inc., 399-A W. Trimble Rd., San Jose, CA 95131. (408)944-6300.

NEW 8L, 24L COLOR DISPLAY BOARDS FROM RASTEROPS

RasterOps has announced its 24-bit true color display boards for the Mac II. The boards provide flicker-free,

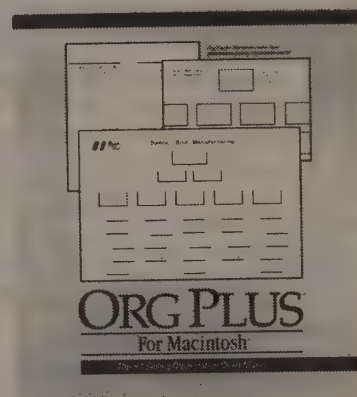
multiple-resolution displays for most 13", 16" and 19" monitors, and support resolutions up to 1024 x 768 pixels at refresh rates of 60Hz or 75Hz. The RasterOps 8L can easily be upgraded to 16.7 million colors by adding additional memory available in the RasterOps 8L VRAM Expansion Kit. Both the 8L and the 24L boards support Apple's Block Mode Transfer, and use the RasterOps accelerator to significantly boost overall performance of graphics-intensive applications. (8L for \$1995; 24L for \$3995; 8L VRAM Expansion Kit \$1995; 8L system package with 8L board and 19" monitor lists for \$6190; 24L system with 16" monitor lists for \$6990; 24L with 19" monitor is \$8190) RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051. (408)562-4200.

MACINTOSH SOFTWARE

ORGANIZATION CHART ON A MACINTOSH

Org Plus For Macintosh, from Banner Blue, offers a solu-

tion for quick, professional organizational charts. Fast chart creation requires no drawing; simply select a box tool and click on the chart to add boxes. Org Plus automatically draws and spaces the boxes and precisely lays out the connecting lines. It also allows you to easily arrange a compact chart to save space. Updating charts is also made easy with Org Plus. Merely choosing a larger font, for example, often requires all boxes to grow and change location. Org Plus maintains a uniform box size and even spacing, automatically, no matter what changes are made. (\$195) Banner Blue, Inc., PO Box 7865, Fremont, CA 94537. (415)794-6850.

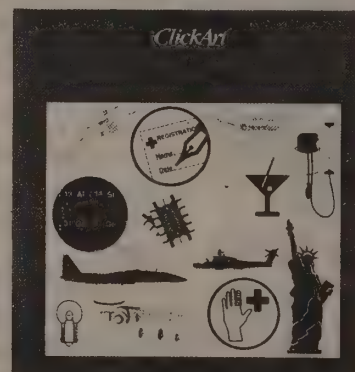


CLICKART SYMBOLS & INDUSTRY

T/Maker continues to add to an already impressive cata-

logue of ClipArt. ClipArt EPS Symbols & Industry Vol. 1 is a collection of high-quality PostScript images that includes: general business and international symbols such as people, finance, travel and politics; military armaments and ranks, including aircraft, ships, and tanks; medical symbols and equipment such as emergency services and instruments; science and engineering symbols and equipment such

as tools and parts; and much more. (Available for the Macintosh and IBM PC; both versions have a list price of \$129) T/Maker Co., 1390 Villa St., Mountain View, CA 94041. (415)962-0195.



PRODUCT UPDATES

► **ViewPoint 4.1**, from **Computer Aided Management**, includes eighteen user-requested enhancements. Registered users can upgrade to v4.1 for \$150. Computer Aided Management, Inc., 1-800-635-5621.

► **Volkswriter, Inc.** announced **Volkswriter 4 Release 2.0**. Volkswriter 4 is the mid-range product in a new line of word processing software that offers users a choice of upgradeable programs to suit their changing needs. Volkswriter, Inc., One Lower Ragsdale Dr., Bldg. 2, Suite 100, Monterey, CA 93940. (408)648-3000.

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Agfa Matrix PCR
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Summagraphics Tablets
Kurta Tablets
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Microsoft Mouse
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TARGA+ 64
NuVISTA+ 1M
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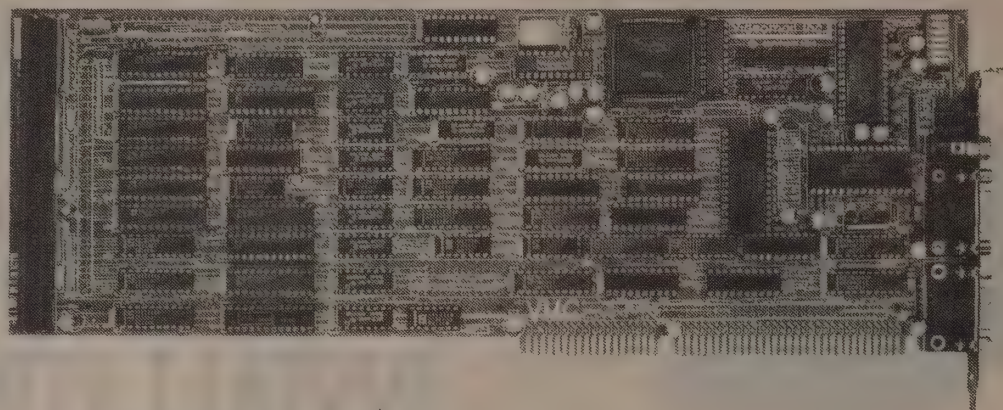
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PRODUCT SPOTLIGHT

Carbon Copy Mac remote control and network management software. By offer-

ing a fifteen-node configuration, Carbon Copy Man NetPack is an affordable solution for small businesses and corporate work groups. It provides network managers with remote access to each node, thus eliminating the need to solve users' problems at the in-

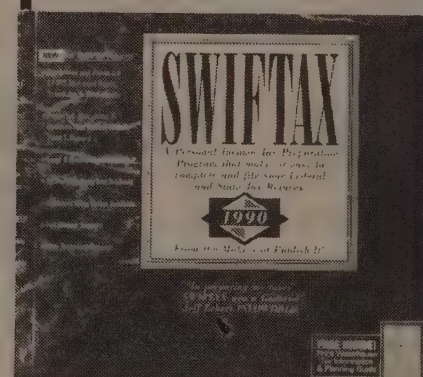
dividual workstations. Carbon Copy Mac NetPack provides various levels of security including password protection, the ability to enable or disable file transfer in either direction, and "need approval" access. In addition, the host computer can be programmed to restrict the accessing computer to read-only or read/write-only access. Carbon Copy operates on Macintosh computers running Finder 6.0 or greater and System 4.2 or greater. (\$999 for 15 nodes) Microcom, Inc., Still River Corp. Center, 55 Federal Rd., Danbury, CT 06810. (203)798-3800.

PC SOFTWARE

TAX TIME FOR THE '90s

SwiftTax for 1990, by Timeworks, is a personal income tax preparation program

for the PC that calculates and prints sixty-one IRS-approved forms, schedules, and worksheets, in-



cluding replicas of 1040, 1040A, and 1040EZ. Five kinds of on-screen help make it possible to use the program without a manual. Using pull-down menus, users can determine which IRS forms to complete. The program then performs high-speed calculations and prints out forms and schedules ready for signing and mailing. It comes with a free Price Waterhouse Personal Tax Advisor book and free technical support. (\$79.95) Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015. (708)948-9200.

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- VGA 800x600, 256KB (Trident chip set) 99
- VGA 1024x768, 1 MB (Trident chip set) 168
- Genoa VGA 1024x768, non-interlaced 119
- ATI (OEM) 256KB 179
- ATI (OEM) 512KB w/ Mouse 229
- VGA Wizard-512KB (1024x768x16; 800x600x256) 189
- VGA Wizard/Deluxe-1MB (1024x768, 256 Colors; non-interlaced) 299
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- Supertan (14" 1024x768, 0.28 dot pitch) \$ 329
- NEC 2A (14" 800x600) 449
- NEC 3D (14" 1024x768) 595
- Nanao 9070U Super Multiscan 1019
- (16" 1024x768 non-interlaced, 0.28 dot pitch) 989
- Nanao 9070S Super Multiscan 989
- (16" 1024x768 non-interlaced, 0.31 dot pitch) 419
- Relisys 5155 Multiscan 299
- Relisys 9513 VGA 639
- Sony 1304 (0.25 dot pitch 1024x768) 289
- TW Casper VGA 94
- 14" Flat screen mono 70
- 12" mono 359

Panasonic Printers

- KX-P1180 9 pin \$148
- KX-P1191 9-pin 219
- KX-P1124 24-pin 268
- KX-P1624 24-pin 359

Motherboards w/CPU

- 8088-10 \$ 59
- 286-12 119
- 286-16 179
- 286-20 279
- 286-25 379
- 386SX-16 369
- ECS 386-25 649
- 386-25 w/64K cache 749
- 386-33 w/64K cache 949
- 486 25 w/ cache 1599

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- Western Digital 40MB, 28MS IDE \$ 219
- ST225 21MB, 65MS MFM 184
- ST251-1 40MB, 28MS MFM 249
- Toshiba 134FA 44MB/66MB, 25MS MFM/RL... 299
- Conner CP3044 40MB, 25MS IDE 305
- Conner CP3184 80MB, 25MS IDE 439
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- NEC D3661 110MB, 18MS ESDI 629
- NEC 5655 150MB, 18MS ESDI 749
- Maxtor 200MB, 16MS ESDI 999
- Maxtor 350MB, 16MS ESDI 1199
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1.2MB Drive, 1:1 MFM
Controller, 200W Power
Supply, AT Case, 1P, 1S
101KB, MS DOS 4.01

386-33 2MB ...\$3171
386-25 1MB ...2439
386-20 1MB ...2195

TEMPO 386

1MB, 1.2MB Drive,
1:1 MFM Controller,
200W Power Supply,
AT Case, 1P, 2S,
101 KB, MS DOS 4.01

386-25\$2012
386-20 1555
386-16 1052

1. 8087, 287, 387

CYRIX

83D87-16/20/25/33 ...\$260/285/385/440

IIT

2C87-8/10/12/20 175/185/215/255
3C87-SX16/DX16 265
3C87-20/25/33 285/385/440



8087-4/8/10 80/115/140
80287-6/8/10 125/175/195
80287XL 195
80387-SX16/DX16 285
80387-20/25/33 345/435/545

2. 1 Meg, 256K, 64K

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1Meg x 1-8\$4.55
256K -8/10/12/15 1.40
256K x 4-8 5.00
64K -10/12/15 1.45
64K x 4-10 2.50

SIMM

4 Meg x 9-8 265
1 Meg x 9-8/10 48
256K x 9-8 15

SIPP

1 Meg x 9-8/10 50
256K x 9-8/10 16

3. ADD-ON CARDS

DTK

Monographic w. Printer\$38
640K RAM Card (XT) 35
Hexa I/O (S,P,G,Ck,Cont) (XT) 48
Penta I/O (S,P,G,Ck) (XT) 39
AT I/O (S,P,G) 35
Mini AT I/O (S,P) 30
AT I/O w/ IDE Controller 69
Serial Card (XT) 19
Printer Card 19
Game Card 19
Controller (see controller section #6)
VGA (see VGA section #19)

EVEREX

Magic AT I/O 49
Magic AT I/O w/ Game port 57

4. BOOKS

All New Books 15% off

Microsoft Press
Osborne MacGraw-Hill Press
Peachpit Press (Desktop Publishing)

5. CASES

AT Jr Case for XT\$30
Baby AT w/ Power 105
AT Case 50
Baby Tower w/ Power 115
Mid Baby Tower w/ Power 145
Tower AT w/ 220W Power 175

6. CONTROLLERS w/cables

ADAPTEC

2322B 1:1 ESDI\$195
1542B SCSI w/ kit 305

DTC

3280 SCSI 135
6280 1:1 ESDI 145
7280 1:1 MFM 79
7287 1:1 RLL 99

DTK

Floppy Controller (XT) 18

Controller 1.2 & 1.44 (XT, AT) 40
IDE Controller 35
IDE w/ AT I/O (P,2S,G) 69

FUTURE DOMAIN SCSI Controller

TMC 850 for XT (H only) 85/145 kit
TMC 875 for XT (F & H) 135/215 kit
TMC 860 for AT (H only) 125/195 kit
TMC 885 for AT (F & H) 145/265 kit
TMC 1660 for AT (H only) 165/295 kit
TMC 1680 for AT (F & H) 195/315 kit

WESTERN DIGITAL

Gen Card (XT) 55
1003V 2:1 MFM 85
1006V 1:1 MFM 99
1006SR 1:1 RLL 115
1007 SE2 ESDI 165

7. DRIVES

TEAC

360K\$60
720K 3 1/2" w/ frame 62
1.2MB 5 1/4" 70
1.44 MB 3 1/2" w/ frame 70

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CP-3104 100MB 25ms 495
CP-2104 200MB 19ms 795

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4380-380 (338)MB 16ms ESDI/SCSI 1225
8760-760 (676)MB 16ms ESDI 1950
LXT 213SY 200MB 16ms SCSI 3.5" 815

MICROSCIENCE

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NEC

D3142 40MB 28ms MFM 295
D3661 100MB 18ms ESDI 595
D5655 150MB 18ms ESDI 695

SEAGATE

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ST-251-1 40MB 28ms MFM 245
ST-4097 80MB 28ms MFM 555
ST-157A 40MB 28ms IDE 245
ST-1102A 80 MB 19ms IDE 435
ST-1239A 230MB 15ms IDE 3.5" 765
ST-277N 64MB 28ms SCSI 345
ST-296N 84MB 28ms SCSI 375

8. KEYBOARDS

NORTHGATE OMNI

1011/101N\$69
102 74
Plus 99
Ultra 109
OTHERS
KEYTRONIC 101 50
MAXI 101 50
MITSUMI 101 45

9. LAPTOPS

CANON

BJ-10e (Bubble jet printer, 4.5lb)\$319
See Printers Section #16

EVEREX

Tempo LX 386-16SX, 1MB
VGA LCD, 1.44FD, 21MB HD, 71b 2099

PANASONIC

CF-150B Backlit LCD
720K FD w/ carrying case 595
Battery for CF-150B 29
CF-170 8086 Backlit LCD
1.44 FD, 20MB HD call

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COMPUTERS INC.

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Mitsumi 101 Keyboard,
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386-33 w/ 64K cache ... 1395
386-25 w/ 64K cache ... 1275
386-25 w/o cache 1135



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T1000SE / T1000XE 999/1405
T1200XE 2085
T1600/20 2195
T1600/40 2495
2400 int modem 259
1MB/ 2MB for T1000SE/XE 250/360

10. MEMORY CARDS

EVEREX

Mini Magic (XT 2MB, EMS)\$65
Ram 3000 Deluxe (AT 3MB, EMS) 84
Ram 8000 (AT 8MB, EMS) 165
Ram 10000 (AT 10MB, EMS) 125
Ram II 4000 (PS/2-5,6,7,80) 195

INTEL

Above Board w/ 512K 325

11. MODEMS & FAX

EVEREX

Evercom II (1200 Baud Int)\$48
Evercom 2400 Baud Int/MNP5 115/145
Evercom 2400 Baud Ext MNP5 185
Fax Modem Int 2400/9600 w/MNP5 239
Pocket Modem for Laptop 2400 & MNP5 215

HAYES

9600 V.42 & V.25 BIS 665
Personal Modem 2400 165
SmartModem 2400 Ext 385
SmartModem 2400B Int 245

INTEL

SatisFaxtion Board 325

VIVA (Computer Peripherals)

2400 Ext IBM/APPLE 115/125
2400 Ext w/ send Fax 125
2400 Ext w/ MNP5 (IBM/APPLE) 145

12. MONITORS

ADI

14" mono amber/paperwhite\$109
14" VGA mono (720x400) 125
14" VGA (1024x768, .28) 365

HYUNDAI

12" mono 70
14" 402B (720x400, .39) VGA 259

IMPRESSION

14" CM414E (1024x768, .28) VGA 345

MATSUSHITA

ViewPerfect 2 (640x480), .29 315
ViewPerfect 3 (1024x768, .29) Int 445
ViewSonic 4 (1024x768, .29) Int 365
ViewSonic 5 (1024x768, .25) Non-Int call

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16" HL6605ATK (1280x1024) Non-Int 1095
20" HA3905ADK (1024x768) 1550
20" HJ6905 (1280x1024, .31) Non-Int 1795
cable 45

NEC

14" 2A (800x600) 455
14" 3D (1024x768) Int 595
16" 4D (1024x768) Non-Int 995
20" 5D (1280x1024) 2385

PANASONIC

14" 1381 (1024x768, .28) 395
15" M1500AT (1280x960) 126dpi
paperwhite w/ VGA card 1050

QUME

830 (640x480, .41) 259

835 (1024x768, .28) Int 375

RELYSIS

15" RE1520 (1024x768, .31) Non-Int 575

SEIKO

14" CM1450 (1024x768, .26) Non-Int 625

20" CM2050 (1024x768, .31) Non-Int 1650

SAMSUNG

CVB4581 (1024x768, .31) Int 350
CVB4587 (1024x768, .28) Int 375

SONY

1304 (1024x768) Non-Int 645

TAXAN

14" Super Vision 720 color 150
20" UV1000 (1280x1024, .31) Non-Int 1450

Repair all monitor models

13. MOTHERBOARDS

DTK

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286-12 150
386SX-16/20 355/495
386-25 w/ cache 705
386-33 w/ cache 895

VLSI

286-12/16 (VLSI) 125/175
386SX-16 345

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486-25 64K cache 1795
486-33 64K cache 2495

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32K 2-Way cache 55
387 Adaptor 65
BIOS Award/Phoenix (386) 60/pair
Keyboard Chip 30

OPTI

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386-25 w/ cache 660
386-33 w/ cache 820

14. MOUSE



C-9 Serial/Bus Mouse\$69/75
C-9 Serial Mouse w/ Win 3.0 130
Catchword 110
Dexxa serial mouse 38
Scanman Plus / 256 169/285
Trackman 85

MICROSOFT

200 PPI serial 69
400 PPI serial/bus 99

MOUSE SYSTEMS

Omni Mouse II 35
PC Mouse III 89
PC Trackball 56
The White Mouse 56

15. POWER SUPPLY

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200W for Baby AT 60
220W (AT) 60
220W for Tower 78
Hard Disk Drive Casing 65W 69
330W (UPS) 199
500W (UPS) 399
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16. PRINTERS

CANON

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Auto Sheet Feeder 85
Battery 45
Print Head Cartridge 22

CITIZEN

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GSX 140 (24 pin) 285
Color Option Add 45
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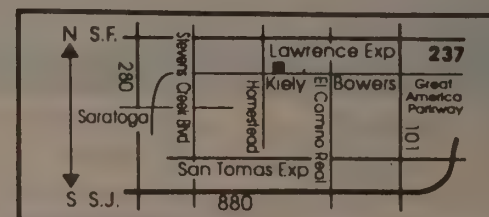
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386-33 w/ cache .. 1155
386-25 w/ cache ... 995
386-25 w/o cache .. 895

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IDE Controller, AT Power Supply
AT Case, Mitsumi 101 KB
Hyundai mono monitor
MGP card

386-16SX 755
286-16 580
286-12 525

EVEREX ABATON

Postscript Laser (3MB) 1795

FUJITSU

DL1100 295
DL1100 w/ color 345
DL3400 365

HP LASER

III w/ toner 1575
IIID w/ toner 2495
Envelope Cassette (15 envelopes) 55
Legal Tray for HP II & III 55
Letter Cassette (200 sheets) 49
Lower Cassette for IIP 160
Paper Tray for IIP 65
Toner for HP IIP 75
Toner for II/III 85

Parasonic

Office Automation

1180 w/ cable 145
1191 w/ cable 225
1124 w/ cable 269
1624 w/ cable 349
32K Buffer for above printers 65
serial interface card 65
4420 w/ cable 775
Developer KX-PDP2 95
Drum KX-PDM2 99
Envelope Tray KX-P431 59
Fonts Card 95
Legal Tray KX-P425 45
Toner KX-P451 39
4450i w/ cable 1175
1MB Memory Card 199
Developer KX-PDP1 95
Drum KX-PDM1 145
Envelope Tray KX-P430 59
Fonts Card 95
Legal Tray KX-P420 45
Toner KX-P450 35
4455 w/ cable (Postscript) 1975
same as 4450i
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6.5sec, 50 to 400dpi, 16 level gray scale
includes ReadRight OCR software .. 995

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ColorScript 100-30i call
QMS-PS 410 4ppm, 2MB, 45 Fonts .. 1995
Envelope Tray 69
Legal Tray / Letter Tray 69
Lower Paper Cassette 139
Toner 95
QMS-PS 810 8ppm, 2MB 2995
QMS-PS 2210 call
QMS-PS 2220 call

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Smart Label Printer (IBM/APPLE) 175

ORANGE MICRO

Grappler 9pin adapter (change 9pin printer
for Apple) 95
Grappler LX 24pin (change 24pin Laser
printer for Apple) 235

PELICAN

All type ribbons call
Toner for Laser Printers call

17. SOFTWARE

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Complete Type Library call
Illustrator 3.0 for Mac 335
Illustrator for Windows 3.0 285
Plus Pack for Mac/Windows 3.0 125
Postscript Cartridge for HP II 285
Streamline for Windows 3.0 225
Type Manager for Mac/Windows 3.0 62

Type Cartridge 1: Display Faces 235
Type Cartridge 2: Best Sellers 235
Type Set 1/2/3 for Mac/Win 3.0 .. 75/75/95

Microsoft

DOS 3.3/4.01 \$60
DOS 4.01 w/ Windows 3.0 135
Entertainment Pack for Windows 3.0 35
Excel for OS/2 295
Excel for Windows v2.1c 292
Flight Simulator 39
Learning DOS 35
Microsoft C 309
Mouse Serial 200PPI 69
Mouse Serial/Bus 400PPI 99
Mouse w/ Paintbrush 105
Mouse w/ Windows 3.0 157
OS/2 Presentation Manager Tool Kit 309
Power Point for Windows 309
Productivity Pack for Windows 45
Project for Windows 429
Quick Basic 4.5 62
Quick C Compiler w/ Quick Assembler 125
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Word for Windows 3.0 299
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Works w/ Mouse 159

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LetterPerfect 135
OfficePerfect 95
PlanPerfect 265
WordPerfect 5.1 239

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Borland Turbo C++ (Dos version) 95
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DESV View 79
286 v2.3 141
386 v2.3 112
Fastback Plus 59
Grammatik for Windows 295
Hardvard Graphics 2.3 39 & under
Individual Software 95
LapLink Rel 3 389
Lotus 1-2-3 Rel 3.1 295
Lotus Freelance Plus Rel 3.0 Upgrade 99
MacPrint 85
More Fonts 89
Norton 89
Commander 3.0 89
Utility Advanced 4.5 115
Utility 5.0 495
PageMaker for Windows 89
PC Tools 6.0 149
pc/MRP3 (Bus Mgmt Acct System) 55
Personal Lawyer/ Lifestyles 269
Protel Easytrax v2 69
Quarterdeck 45
Expanded Memory Manager 386 59
Manifest 39
Qram 74
Quicken for IBM/Mac 439
Quicken w/ Turbo Tax for IBM 3
SCO Xenix 386 Operating System 145
Software Source (Public Domain) 33
Sound Blaster 29
Speaker 325
CMS Chip 74
SummaSketch II Digital Digitizer 519
Turbo Tax w/ Quicken for IBM 245
Ventura Publisher Gold for Windows 245
Wordstar 6.0

18. TAPE BACKUP

COLORADO

DJ-10 (40,60,120MB) \$265
AB-10 Controller 75

EVEREX

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60MB (DC600A)/ Ext 655/775
125MB (DC600A)/ Ext 895/1025
150MB (DC6150)/ Ext 925/1045
250MB (DC6250)/ Ext 945/1065
60MB-PS/2 (DC600A)/ Ext 765/885
125MB-PS/2 (DC6150)/ Ext 1015/1125
150MB-PS/2 (DC6150)/ Ext 1055/1175
250MB-PS/2 (DC6250)/ Ext 1075/1195
40MB Teac (Casset 600H)/ Ext 495/595
60MB Teac (Casset 600H)/ Ext 555/645
40MB AT Floppy (DC2000) 235
60MB AT Floppy (DC2120) 255
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40MB PS/2 Floppy (60,80) (DC2000) 275
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19. VGA CARDS

All VGA cards come 1024x768

ATI Wonder 256K/512K \$170/185
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Everex Viewpoint 256K/512K 165/185
Everex VRAM 512K/1MB 299/399
Genoa 256K 6300/6400 135/155
Genoa 6400A 512K 225
Orchid Prodesign II 512K/1MB 289/309
Paradise Plus 256K/512K 185/205
Super VGA 1MB Trident chipset 179
Video 7 1024i 256K/512K 195/215
Video 7 VRAM 512K 365

20. MISCELLANEOUS

Anti-static Dust Cover/ Mat 111/2"x22" \$6/16
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Data Switch
AB 25pin / 36 pin 20/25
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Crossover 25pin 26
FunKey Templates 2.98/3.98
Intel Inboard 385/PC 695
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Protector:
Modem/Power 18
Surge 9
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Western Digital Ethernet Card
8 bit / 16 bit 145/185
Under Table Keyboard Drawer 24
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WordPerfect/ 13

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2S, 1P, 1Game
Tower Case, 101 Keyboard

486-25 2255
386-33 1355
386-25 FCC A 1095
386-25 AT Case 1095
386-20SX 855
386-16SX 765
286-16 595
286-12 495

PACIFIC

DATA PRODUCTS

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for II, IID
1 MB \$140
2 MB 190
4 MB 290

Pacific 4 Memory

for IIP, III same as above

LP Memory

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1 MB 140
2 MB 190
3.5 MB 265

Pacific T Memory

for Epson 6000
2 MB 235
4 MB 325

FONTS

25 In One! III

for II, IID, IIP, III 265

Headlines Cartridge

for II, IID, IIP 185

Pacific Outlines I/ II

for III 205

POSTSCRIPT

Pacific Page

for II 265

Pacific Page & 2MB

for II 389

Pacific Page P.E.

for IID, IIP, III 325

Pacific Page & Pacific Talk

for Mac & IID, IIP, III, IIID 450

OTHERS

Pacific Bar Code

for II, IID, IIP, III 315

Pacific Connect

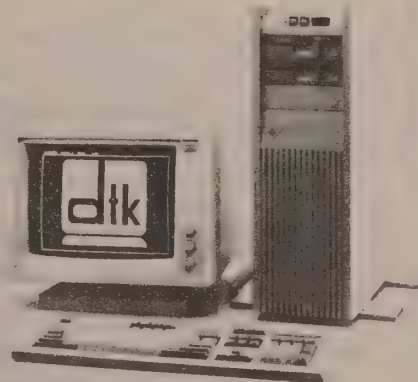
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5 PC or 4 Mac to a printer
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for II, IID, IIP, III, IIID 225

Plotter Cartridge

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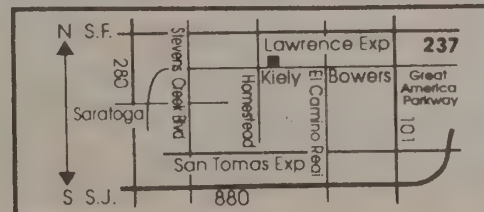
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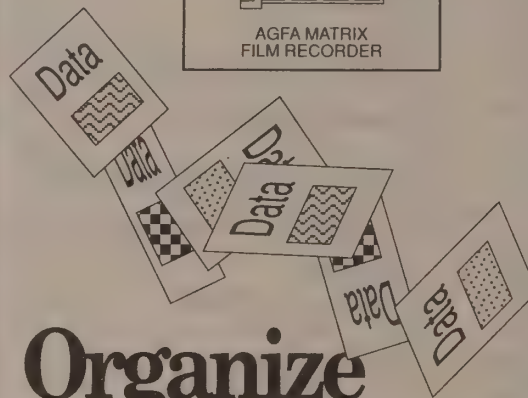
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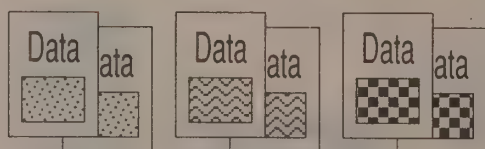


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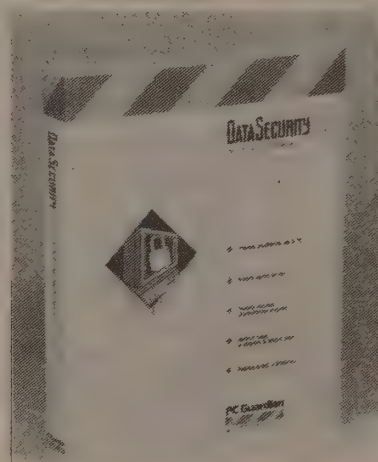
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Fax: 415-543-2615

PRODUCT SPOTLIGHT

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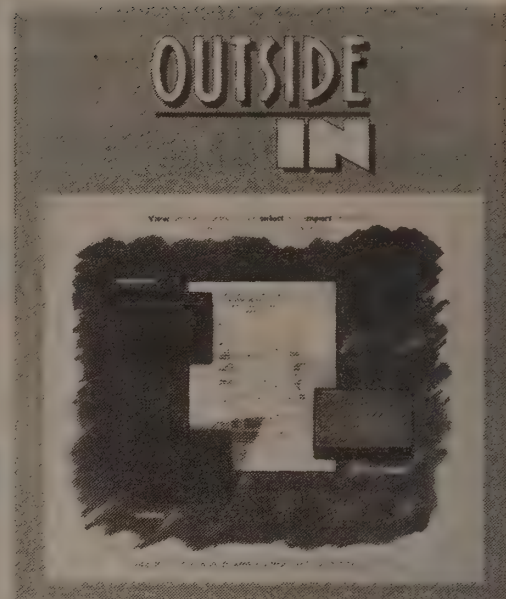


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Plus firmware circuit board controls the boot process and provides a high level of security. It works with the Access Control module to prevent unauthorized access to the PC and its data, and may be combined with the other software modules. Data Security Plus is also available in French and Danish versions. (\$69.95 to \$279.95) PC Guardian, Inc., 118 Alto St., San Rafael, CA 94901. 1-800-288-8126.

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• AST Toner Kit For TurboLaser	\$9
• AST OPC Kit For TurboLaser	\$175
• Logitech C7 Mouse	\$9
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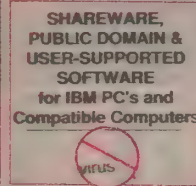
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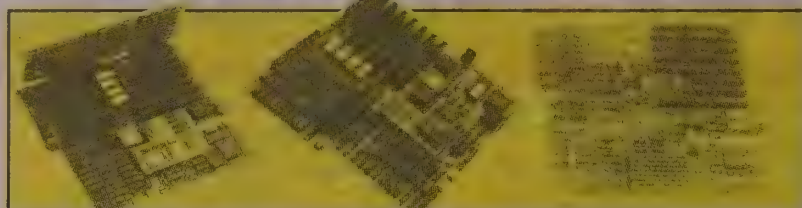
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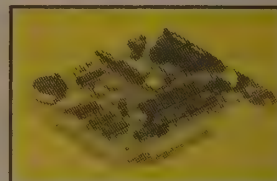


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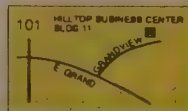
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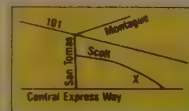
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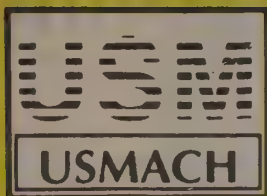
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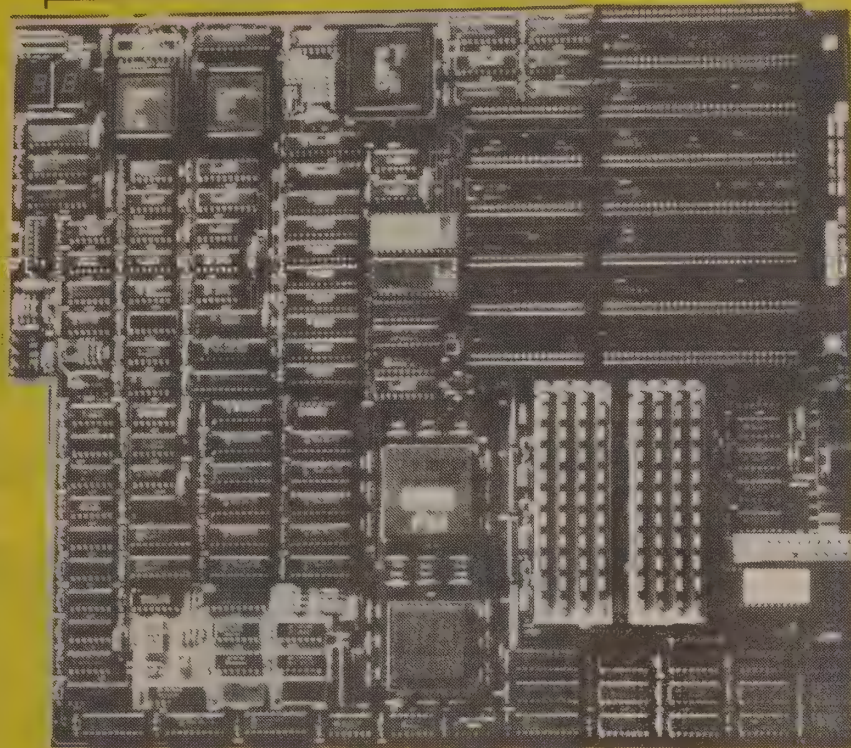
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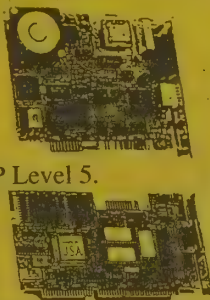
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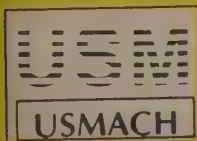
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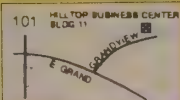
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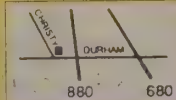
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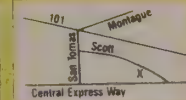
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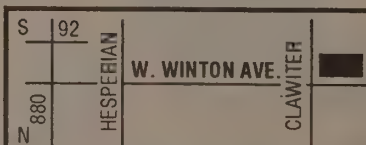
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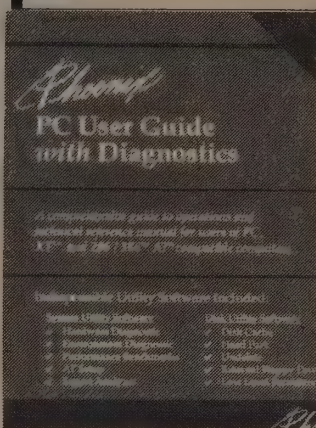
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their customers'
demands for qual-
ity, well-written
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plete technical ref-
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Utility software
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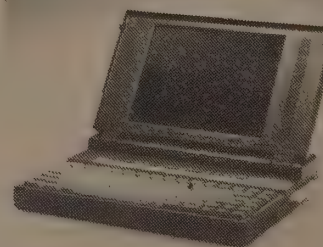
Guide includes: Hardware and Environ-
ment Diagnostics, Performance Bench-
marks, AT Setup, Low Level Formatter,
External Driver, Undelete and Disk
Cache. (\$79.95) Phoenix Computer
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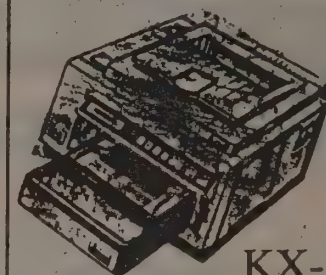
CX-25486..486 25MHz	\$1999
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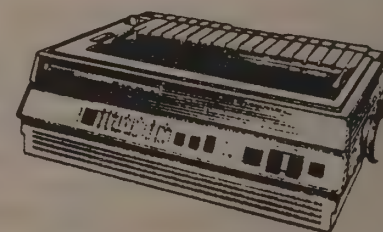
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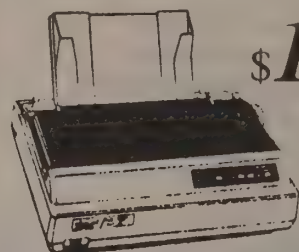
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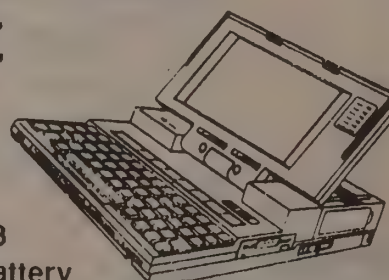
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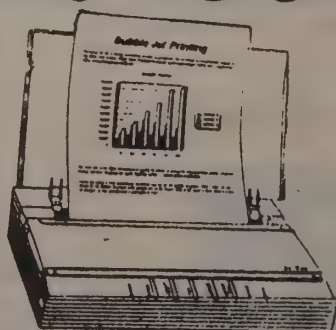
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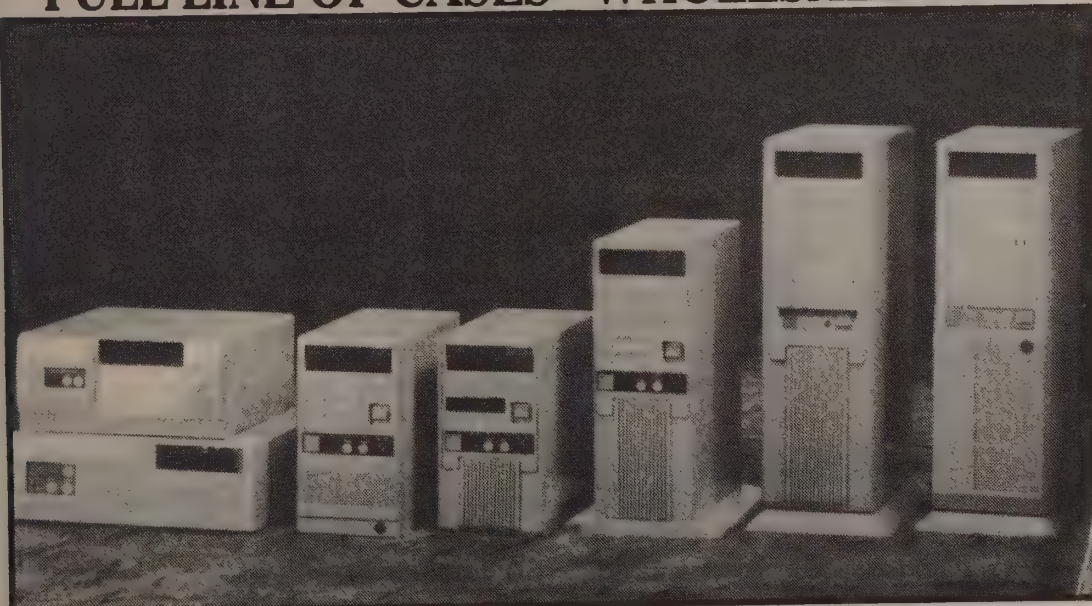
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NAME OF STORE _____

CITY, STATE _____

1) About how often do you visit this store each
MONTH _____ or per YEAR _____ ?

2) Do you buy product for (check all that apply):
_____ WORK _____ HOME OFFICE _____ PERSONAL USE

3) When you last made a purchase at this store, did you buy
(check all that apply):
_____ HARDWARE _____ SOFTWARE _____ OTHER

4) What is the typical dollar amount you spend each time you
buy a product from this store? \$\$ _____

5) Do you receive mailings from this store?
_____ YES _____ NO

6) Where do you usually notice ads for this store (check all
that apply):

_____ MAGAZINES
_____ NEWSPAPERS
_____ RADIO
_____ TELEVISION

7) In the past month, have you recommended this store to
a business associate or friend?
_____ YES _____ NO

8) Rate your favorite store in the following areas by circling
the number you think best describes your overall satisfaction
where: 1 - is lowest; 5 - is average; 9 - is highest.

	LOWEST		AVERAGE		HIGHEST
OVERALL	1	3	5	7	9
BEST BRANDS	1	3	5	7	9
SELECTION	1	3	5	7	9
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EXPERTISE	1	3	5	7	9
AMBIENCE	1	3	5	7	9
CONVENIENCE	1	3	5	7	9
LOCATION(s)	1	3	5	7	9
BUSINESS HRS	1	3	5	7	9
PARKING	1	3	5	7	9
TURN-AROUND	1	3	5	7	9
RETURNS	1	3	5	7	9
SERVICE	1	3	5	7	9
PRODUCT SAVVY	1	3	5	7	9
HONESTY	1	3	5	7	9
HANDLE DETAILS	1	3	5	7	9
FIX PROBLEMS	1	3	5	7	9
INSTALLATION	1	3	5	7	9
TRAINING	1	3	5	7	9
SUPPORT	1	3	5	7	9

9) What one improvement should the store make?
(write here or use separate sheet)

10) Do you shop other stores? YES NO
If YES, name the store(s) you use to comparison shop

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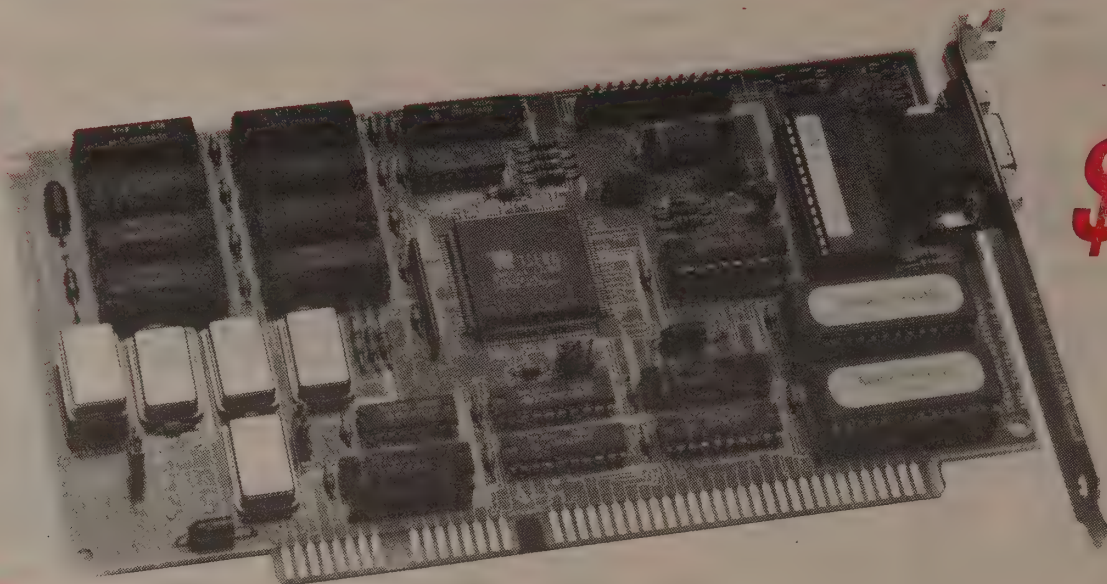
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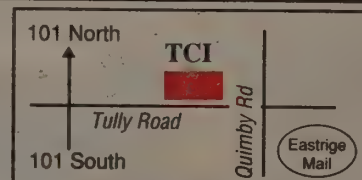
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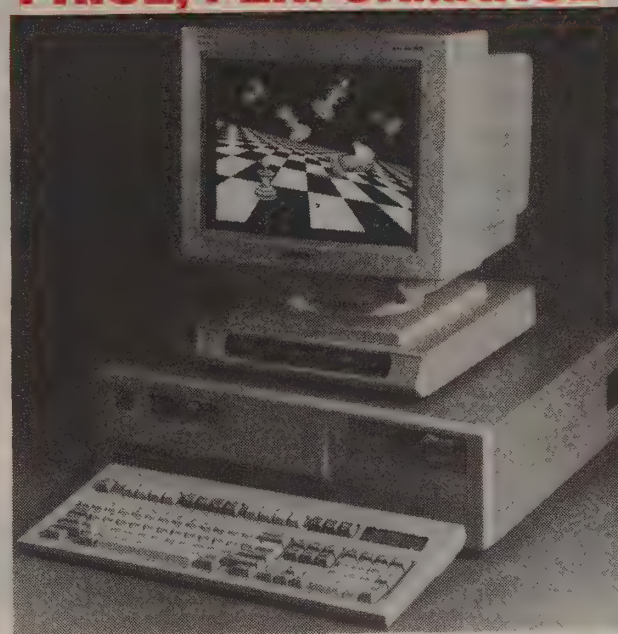


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- 1:1 Interleave 2 (Hard Disk & Floppy) Controller
- 2 Serials, 1 Parallel, 1 Game Port
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- (1) 32-Bit, (6) 16-Bit, (1) 8-Bit
- 1.2MB Floppy Drive (TEAC)
- 1:1 Interleave 2 (Hard Disk & Floppy) Controller
- 2 Serials, 1 Parallel, 1 Game Port
- Real Time Clock/Calendar & Battery Back-Up
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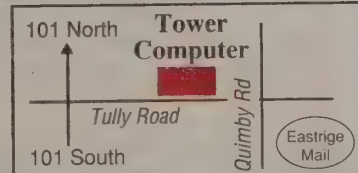
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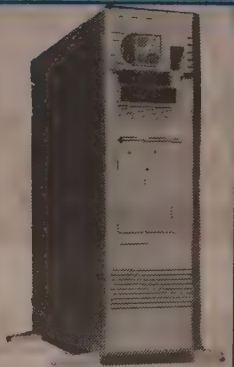
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LANDMARK = 16

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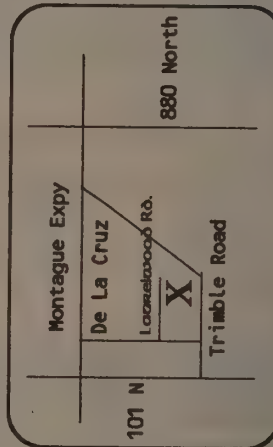
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MORGENSTERN

The new year is coming on strong—I can see its reflection in the corner of my monitor. I'll have to adjust my brightness controls.

I'll save the mystical look at what's ahead for the new year until next month. Here's a secret of Mac fortune tellers: wait until the debris of the January Macworld Expo is swept away before forecasting new hard- and software. The future is a little clearer after a prototypical visit to developer hospitality suites.

Here are some year-end observations, reflections, and words of limited wisdom.

Most creative use of the word Advantage: "It has advantages that the Mac doesn't"—Hydra Systems.

Last September, I was almost knocked to the floor by a frantic tipster with news of a Macintosh clone. It was a card for MS-DOS computers, produced by a Silicon Valley company, that could run Macintosh programs. The price was unknown, but less than \$1,000. I was underwhelmed.

BMUG

There have been reports of clones every six months since the Mac was born in 1984. They've been reported in Hong Kong, Brazil, and Hungary. The FBI has had to build a branch office in Apple headquarters to handle the traffic. How likely was a legal clone going to appear in the shadow of the fountainhead? Anything is possible in the Valley, but I wasn't going to hold my breath.

I called supposed clone masters, Hydra Systems, and asked a few questions. The sales representative was wild with praise for the upcoming product, the Hydra One, but developed a quick case of speech impediment when he discovered that I knew anything about the Macintosh. He even tried the old we're-real-busy-now-call-back-later dodge. I finally force-phonied my way into the back room, and talked to a T-shirted technician.

There are some interesting technical hacks. Hydra One works on XT, 286, or 386 machines, with EGA or VGA. The PC hard disk drive is mapped as a SCSI drive, and the PC acts as a background RAM cache. This is pretty good stuff, but here's the rub.

The Hydra board is an emulator, not a clone. It requires the buyer to purchase Macintosh 128K ROMs separately, and install them on the board. This is a formidable problem.

The market in used ROMs has been shrinking lately. Emulators for Amiga and Atari computers are chewing up the supply. Even worse was the recent conviction of a ROM bootlegger. The stiff sentence handed out may dissuade other would-be lawbreakers from supplying illegal chip sets. Hydra Systems is supposedly developing its own Mac-compatible ROM to improve the supply. It can join the club of other companies that have tried and failed at this task.

Are PC users going to want to spend their cash on a hardware hack? Why not buy a Classic, or a used SE, and use a null-modem cable to transfer data? The going price of a used SE with a 20Mb drive is the same as the Hydra board and gray market ROMs. PC users will go to almost any lengths to avoid really buying a Macintosh—it's a theo-

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logical question.

Marvel comix fans will remember Hydra as the group of fiendish criminals that populated the *Nick Fury, Agent of S.H.I.E.L.D.* series in the 1960s. Cut off one head and the emulations will continue!

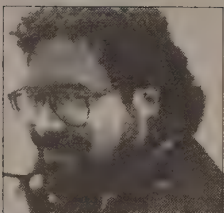
The dangers of standing too close to the microwave oven—
Randall Fields, chairman of Mrs. Fields Inc.

Think the debate on computer user interfaces is over? Think again. The way we interact with our technology is more than a matter of personal preference—it's a political battle.

Mrs. Fields is the cookie stand found in every shopping mall around. Randall gave the keynote address at the last Portable Computing Expo. He flamed the Macintosh, and all graphic user interfaces (GUI) for computers.

"The Macintosh must have been designed by the Soviet Union to limit American productivity," was one of his no-brainers. He said he couldn't "understand why Bill Gates would want to take our economy down the tubes by introducing Windows." He foamed at the mouth in his opposition to icons. I've often wondered if these rabid anti-GUIs have ever really *used* a Macintosh, other than a brief look-see in a computer store at the local mall.

The Life's-Tough-All-Over Award—Bill Gates, Microsoft Corporation.



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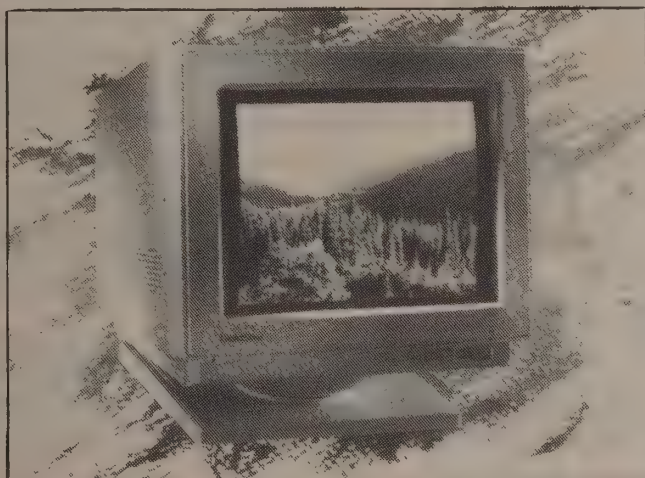
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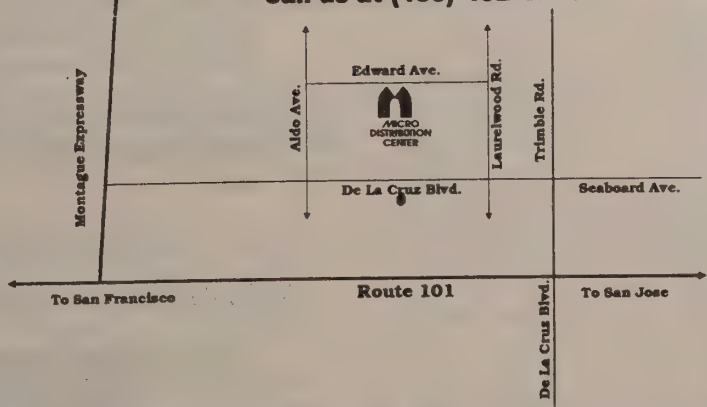
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Here were the words of hope for the eager crowd of users at COMDEX: "The computer can be a much more effective tool than it is today." Making computers easier to understand and use is "a formidable challenge." Penetrating analysis from the world's leading supplier of software.

Microsoft obviously knows better than anyone else what's needed. Users will have

to patiently shell out the cash, while the geniuses work out the bugs in the myriad of operating systems and programs MS hawks. Of course the Microsoft braintrust thinks it knows more than Apple does about the Macintosh. Might makes write.

Bill Gates has an unbroken streak of cancellations at BMUG meetings. His office calls, and sets a date for him to speak to a

meeting. A while later, he's on the phone backing out. The latest word is, "I'll get back to you."

Best advice that most users do not like to hear—Your computer knows better than you. Trust what it's telling you.

I've received frantic phone calls from users who have lost hours, days, weeks and even months of work because they didn't pay attention to what their computers were trying to communicate. This thick-headed bunch won't make the smallest effort to listen to their digital friend. They ignore frantic error messages and beeps from their applications, warning of impending danger. They're too busy to be bothered with such things—they've got important work to do!

Just as bad are the users who ignore the out-of-the-ordinary hints that a problem is brewing. A paragraph on the screen is inexplicably turned into alphabet soup, but the fingers keep on typing away. Each cut and paste advances their work toward the dreaded bomb.

A commonplace action is prevented for lack of memory. "Impossible," you say, "I have 5Mb of RAM." If your computer, operating system, or application thinks otherwise, who are you to tell them different? You can yell all you want at these naughty children, but they'll never listen!

Instead of getting angry and trying to prove yourself superior to an inanimate device, the wise user will save the document and get out of town. Restarting does wonders for transient software problems, called in the trade *anomalies*. Even programmers treat these annoyances as digital weather.

The on-line Hacker's Dictionary calls them *obscure*, "Used in an exaggeration of its normal meaning to imply a total lack of comprehensibility. *The reason for that last crash is obscure. Moderately obscure* implies that it could be figured out, but probably isn't worth the trouble."

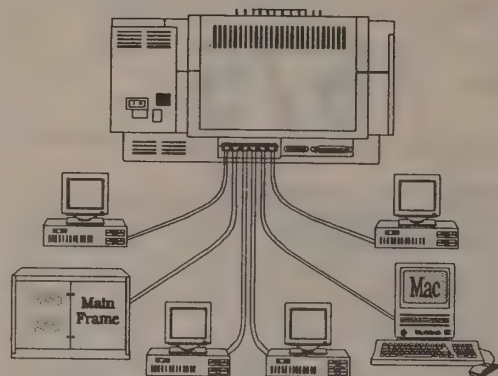
So listen to your Macintosh. Maybe surprise it with a gift—a little extra RAM, a monitor cover, or a utility program. The two of you will be very happy together!

Best Virus of 1990—ZUC, the Zucchini virus.

This virus was discovered by Don Ernesto Zucchini in Italy last May. ZUC makes the cursor go crazy when the mouse button is held down. The cursor moves diagonally across the screen and then bounces from side to side like a billiard ball.

This was the year of the virus and Trojan horse. Four viruses were written by a teen-

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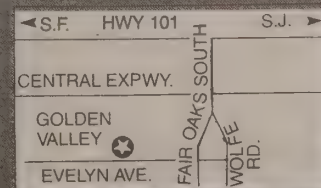
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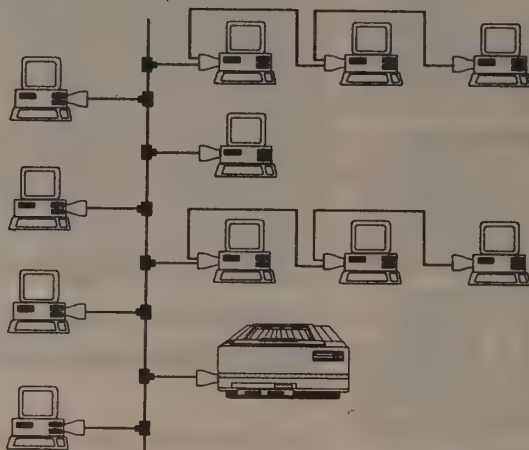
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WHAT IS BMUG?

BMUG is an educational non-profit consumer advocacy group organized to share information, and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its ten thousand international members. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), a free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6-9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG HelpLine, (415)849-HELP, and our fax number, (415)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am - 5 pm). If your question can't be answered on the spot, we try to get you in touch with someone that can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around, with 600+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the PD ROM™ Version II, our library, and more on CD-ROM.

Our BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you are as well as send mail to users

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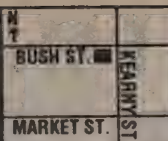
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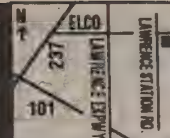
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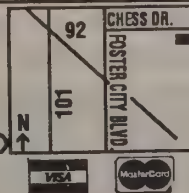
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CREATIVE TOOLS

ager from New Jersey, who was nailed by the police. Perhaps young punk hackers will get the word that creating a virus is not cool, and hurts the community of users. We could use their energy, help, and real programming.

Here's a list of 1990 virus introductions:

Anti B virus
CDEF virus
FontFinder Trojan
MDEF A (Garfield) virus
MDEF B (Top Cat) virus
MDEF C
Mosaic Trojan
PostScript hack virus
Steroids Trojan
ZUC (Zucchini) virus

Best imitation of a Macintosh developer—
Jim Lennane, CEO, DeScribe, Inc.

Macintosh developers have been complaining for years about overpriced and underpowered computers from Apple. They finally got some help with the new models.

There seems to be an echo in the OS/2 world.

DeScribe is an OS/2 word processor that's

supposedly been \$4 million in the making and marketing. CEO Lennane let IBM have it between the eyes at the last Seybold Publishing show, complaining of IBM's and Microsoft's lack of support.

"Where's a decent OS/2 machine?" he asked. "Why hasn't IBM introduced an under-\$5,000 desktop machine with eight megabytes of RAM?"

He also complained that he wasn't being granted an audience with the IBM bigwigs to discuss planning and strategy. He said of IBM executive Jim Cannavino, "I bet if I said I was interested in buying four million dollars' worth of their DOS PCs, he'd be in the Businessland parking lot kissing my butt!" Something we could all get behind.

BYTES AND PIECES

•Microseeds Publishing, Inc. sent out an update (1.01) to its astrological program, Astrix. It was done to fix "astrological miscalculations." Thank goodness they've fixed the program! When I thought of all the world leaders that were using the program, think-

ing they were getting the most accurate prediction science available to base important decisions of international consequence—it made my knees turn to jelly.

•The frustration of Mac salespersons around the supply of new Macs was evident in *The Top Ten Things to Say When Your Customer Wants to Buy a Macintosh Classic*, faxed to BMUG. Some of the gems included:

"Huh? You'll have to speak louder!"

"Say! Did you know the female gibbon gestates for 236 days?"

"A wise choice, but listen. I've got a great deal on a couple of used Mac Pluses..."

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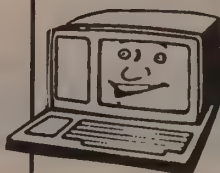
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PAGEMAKER-MAC 4.0	467
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• autodesk	
AUTOSKETCH VER. 3.0	141
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• informix	
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WINDOWS	419
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115	
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CLIPPER 5.0	470
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TIMESLIPS III	171

• nolo press	
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• ocr systems	
READ WRITE	319
READ WRITE PERSONAL	167
• peachtree software	
COMPLETE BUSINESS	
ACCOUNTING III	147
• patton & patton	
FLOW CHARTING III	137
• polarus	
□ PACKRAT/WINDOWS	252
• precision inc.	
□ SUPERBASE 4 WINDOWS	393
• publishing technology	
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• quarterdeck	
MANIFEST	37
DESQVIEW	77
DESQVIEW 386	121
GRAM W/MANIFEST	52
*QEMM/386 W/MANIFEST	59
• qms imagen	
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ULTRASCRIP PLUS	252
• reality tech	
WEALTH BUILDER	135
• reference software	
GRAMMATIC IV	55
□ GRAMMATIC/WINDOWS	55
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RIGHTWRITER	59
• roykore	
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• samna	
□ AMI PROFESSIONAL	282
• scitor corp.	
PROJECT SCHEDULER 4	435
• solution systems	
BRIEF EDITOR	179
• simon & schuster	
TYPING TUTOR 4	35
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□ COMMAND POST	39
□ FROM BASE	282
□ SUPERPRINT/WINDOWS	105
□ PC PAINTBRUSH FOR WINDOWS	89
• wordstar	

WORDSTAR 6.0	262
• word perfect corp.	
LETTER PERFECT	127
DATAPERFECT	259
DRAW PERFECT	257
WORD PERFECT VER. 5.1	242
WORDPERFECT OFFICE 3.0	91
WORDPERFECT LAN NODES	159
WORD PERFECT EXECUTIVE	137
OFFICE LAN	282
• xerox corp.	
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• z soft	
P.C. PAINTBRUSH IV +	112
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SCANNER	559
THE COMPLETE	
COMMUNICATOR	539
COMPLETE FAX	
9600 PORTABLE	279
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UNIVERSAL COMPUTER	
STAND	22
UNIVERSAL PRINTER	
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COMPUTER TOOL KIT	21
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PACIFIC PAGE/POST	
SCRIPT	469
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environmentally friendly.

• Here's a top ten list from a recent BMUG meeting. I take the blame of authorship of this one.

The Top Ten Computer Pickup Lines:

10. Is that a modem in your pocket, or are you just glad to see me?
9. Of course our formats are compatible!
8. I've had all four eyes on you, Baby!
7. Why do you think they call them "X" Commands?
6. Mmmm, you smell nice! Is that musk, or flux remover?
5. You've got the booleans I've been searching for.
4. Spread sheets are my speciality.
3. I can bench press four Mac Portables!
2. You know what they say—hard drive, hard...
1. Sure I'm a user, Baby—but aren't we all?

• BMUG has a new book out! It's called *Zen and the Art of Resource Editing*, the BMUG guide to ResEdit 2.1. That's the real released

version of ResEdit, not one of the development versions with a letter "b" stuck to it. In the grand tradition of BMUG being on top of things, we are proud to say that our book will be available one month before Apple releases its own Reference Manual.

The book explains practical uses of ResEdit 2.1 for real people—developers and non-developers alike, who want access to the tools of ResEdit. The book has sections on Finder customization, and font, icon, and cursor editing. Over thirty resources are explained in depth.

The new version of ResEdit has many advantages over the last general release (version 1.2). Interestingly, the opened file window now shows the available resources as icons, instead of their names. There are also up-to-date editors for many previously cryptic resources.

The book comes with a disk containing ResEdit 2.1, several utility programs, and a collection of color icons to play with. The combo is \$20. ■

UPCOMING EVENTS:

- January 10 Virtus Walkthrough (CAD), Aldus FreeHand.
- January 17 Spyglass Spyglass, Guy Kawasaki.
- January 24 Wacom Super Digitizer, Time Arts Oasis.
- January 30 BMUG West meeting at SF Exploratorium museum. Golden Triangle DiskTwin, Lotus Marketplace.
- January 31 Symantec More 3.0, National Instruments LabView.
- February 1 SuperMac, Microcom Software Carbon Copy Mac, MicroWriter Ltd. Agenda (palmtop computer).
- February 14 Storm Technology Picture Press (compression), Aladdin Stuffit Deluxe.
- February 21 Bravo Technologies MacGraphX, Central Point Software MacTools.

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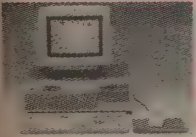


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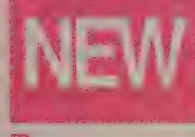
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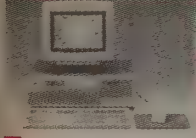
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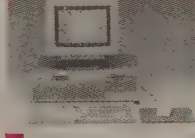
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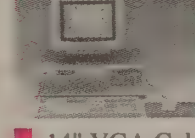
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Hard Disk Help

*Also: Graphics, Startup Devices,
And New Publications*

BY MATTHEW
LEEDS

Hard disk drives on the Amiga have been a mixed blessing.

On the one hand, the large graphic and animation files that typical applications create cry out for a hard drive's storage space, and the disk-based operating system needs a hard drive's speed for efficient use of any Amiga. However, the Amiga's file system and hard drive standards are often difficult to understand and manage. The lack of a good hard disk maintenance and repair program has left more than one Amiga user stuck in the reformat and restore cycle for far too long.

QUARTERBACK TOOLS

Central Coast Software has just released Quarterback Tools, a collection of disk maintenance tools designed to maximize the speed and reliability of Amiga hard and floppy disks.

QBT repositions your files to optimum locations on the disk. It eliminates file fragmentation and consolidates free disk space. It recovers deleted files easily and safely, "unformats" disks you formatted by mistake, and finds and fixes corrupted directories (drawers). QBT searches the entire disk for errors, marks bad areas "out of service," and identifies affected files. It reformats all types of disks for either new or old Amiga filing systems. The program cures disk validation problems and key checksum errors.

QBT provides a choice of optimization algorithms to suit your needs. If you use the Workbench, it places .info files as close as possible to the drawer to which they belong. If you're a CLI user, it places .info files with other files in a drawer. It multitasks from Workbench or CLI, but does not use all available memory. You can set the amount of memory QBT takes to reorganize a volume. The more memory you allow it to use, the faster it finishes its work. QBT provides an AREXX interface for "power users." It will work on any AmigaDOS volume of up to 1Gb (1000Mb).

QBT requires Workbench 1.2 or later, and supports Workbench 2.0. It runs on any

Amiga with at least 512K. It works with all Amiga hard drives and floppy drives and all Amiga filing systems. It's produced by the same company that makes Quarterback, the hard drive backup program, and anyone who has used that product will recognize a familiar feeling when using QBT. Its interfaces are not always the most elegant, but its products are always solid and reliable. This product should be a part of any Amiga hard disk drive user's repair kit.

AMIGA AUDIO

While the Amiga has always had a reputation as a graphics computer, pumping out visual wonders, it also has garnered a respectable collection of audio software. One of the more successful examples of this genre has been AudioMaster, originally handled by Aegis, now distributed by Oxix. The most recent release of this audio sampling and editing package is version III.

AMIII supports most sound samplers that attach to either the mouse port or the parallel port. It can take advantage of expansion

memory to make samples larger than those that would fit in chip memory alone. The on-screen editor lets you easily cut, paste, insert, and replace pieces of the waveform. In addition, loop points can be easily set. Once a sound sample has been created, you can resample it internally to a lower sample rate for compatibility with other programs.

You can also retune a sample to any pitch. This makes it easy to use any sample as a musical instrument. By mixing samples you can also create hybrid instruments, and by adding flange when mixing waveforms you can make a choir out of a single voice. Adding echo can transform a flat sample into a sound with real-world ambiance.

A low pass filter function is included to reduce noise and aliasing. An auto zero cross-over seek helps to eliminate annoying clicks in looped samples.

Advanced features in AMIII include the ability to create five-octave instruments in Sonix format (the only program that can do this), a RAM scan feature that can find sound data left by other programs, and up to 999 loops on a single sample. It also provides the

A M I G A

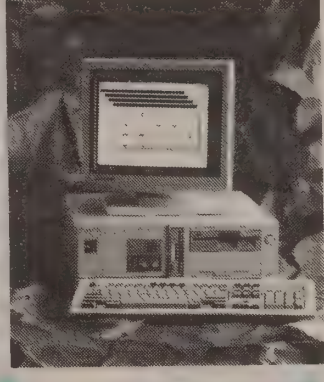
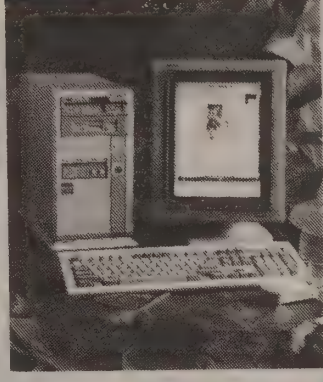
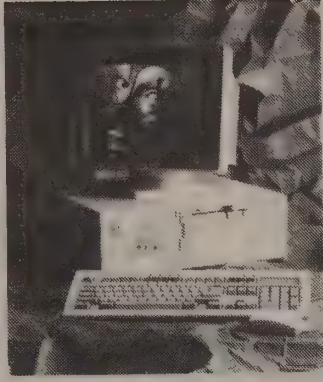
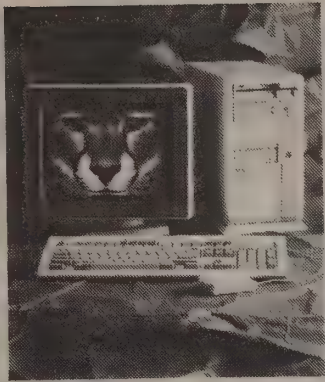
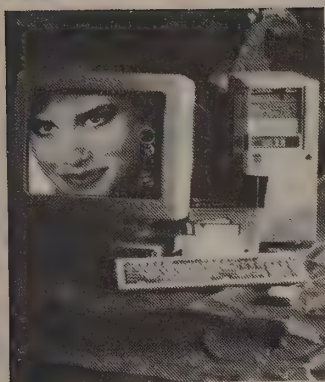


Copyright © 1990. All rights reserved. Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.

The MultiStart will let you place a Kickstart v1.3 and a Kickstart v2.0 chip on it, and let you select which one you will be running under during powerup. Of course, it doesn't exist yet.

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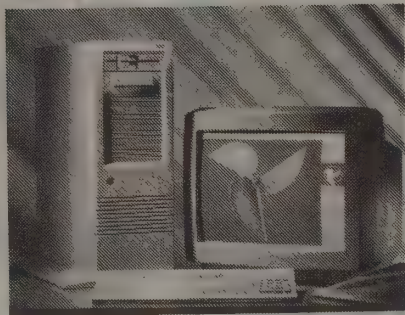
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MULTISTART II

The Amiga market continues to be one of the most interesting in the consumer computer field. A company called DKB Software (all it seems to make is hardware) has been running an ad for several pieces of hardware, including a device called MultiStart II. This is a small add-in board for the A500 and A2000 (they also advertise a slightly different device for the A1000) that has room for three ROM chips on it. Essentially it will let you place a Kickstart v1.3 and a Kickstart v2.0 chip on it, and let you select which one you will be running under during powerup.

Clearly this will be a useful device when Kickstart v2.0 chips become available. Right now, Commodore has not made a public statement about the upgrade path to v2.0 for A500 and A2000 owners.

The interesting thing is that DKB has not produced any of these devices even though it

is advertising them. It has engineered the hardware, and says that once Commodore releases v2.0 ROM chips, and the public starts ordering its device, it will start making them. I guess the ads are to stave off competition from other hardware companies that might make similar devices, or to give owners of A500s and A2000s a sense of security that they will be able to have their cake and eat it too. Seems a little out of line to me.

NEW MAGAZINES FOR AMIGA TECHS

Both *Amazing Computing* and *AmigaWorld* have announced new magazines devoted to the technical side of the Amiga. Each will include a disk with source code for the programming tutorials and projects that will be included. Both will have hardware projects for the soldering iron adept. Both will have a cover price of \$14.95. The *Amazing* offer will be called *AC's TECH for the Commodore Amiga*, and *AmigaWorld's* will be called *The AmigaWorld Tech Journal*. Sounds like there may be a battle over readers in what appears

Quarterback Tools should be a part of any Amiga hard disk drive user's repair kit.

to be a very narrow market niche, with magazines that have too-similar names. Time will tell.

PD OF THE MONTH

Public domain program of the month is SendMorse by Joe Larson. Pass it a text file and it will send it as Morse code at a user specified word rate. Great for working on a ham license. Source code is included for the hacker. ■

RESOURCES

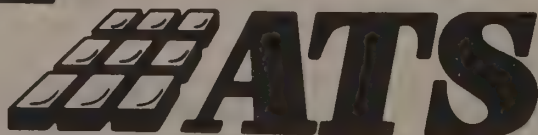
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Atari At COMDEX

Long-Rumored Machines Materialize

BY DAVID HAWKINS

This is my first opportunity to talk about what Atari was showing at COMDEX in November. Some of these products have been talked about for quite some time, and now they're showing up in the stores.

THE STE

First is the Atari 1040 STE—an enhanced 1040 ST. In a lot of ways it's just like the Atari I've been using for four years—runs on a Motorola 68000 and comes with 1Mb of RAM.

The enhancements? It's easier to install more RAM on the STE. You can have up to

ATARI ST

4Mb. It includes the Blitter graphics coprocessor chip.

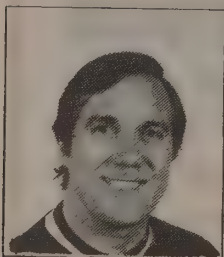
And it's capable of digital stereo sound.

The operating system, TOS, has had some improvements. This allows the STE to provide a better graphic display. The STE has an impressive range of devices you can hook up to it: MIDI, audio jacks, color monitor, monochrome monitor, TV/VCR, mouse, joystick, cartridge, printer, hard disk, floppy disk, and



dhawk's Dream Machine, the TT030—power, ST software compatibility, and, soon, UNIX.

The Mega STE and the TT both have an improved desktop, the graphic interface you see when using the computer. It's getting easier to use and has some special features.



Copyright © 1990 by David Hawkins. All rights reserved. David Hawkins is the host of the Atari conference on The WELL (415/332-6106); send email to dhawk. He has one of the first Atari ST 1040s sold in San Francisco. Both monitors, an Okimate 20 color printer, and disks are all over the room.

a modem. The ports for all of these are built-in for the STE. I'd bet the lights would flicker if you turned all of that on at once.

AND THE MEGA STE

The Mega STE has all of the above, plus a little bit more. The Mega comes with 2Mb of RAM and can be expanded to 4Mb. It runs at 16MHz, while the STE runs at 8MHz. The one addition is a VME slot, which can be used for expansion cards.

The Mega STE looks slightly different from the STEs. The 1040 STs are one unit, with the CPU and keyboard in the same case. The Mega STE has separate units, which makes it easier to replace the keyboard, or to make other modifications in the system.

THE TT—A GRAPHICS WORKSTATION

When I win the lottery, this is what I'm buying—the Atari TT. It's a 32MHz, 32-bit computer system based on the Motorola 68030. It

has a 68882 enhanced floating point coprocessor. It looks like it would be a natural for desktop publishing and graphics applications.

The TT has 2Mb of RAM installed and can be extended to 26Mb. Atari is working on making UNIX and X Windows available for the TT.

Actually the retail price is under \$3,000, so I might not have to wait for the Lotto. I'd guessed the price would be over \$3,000 last month, so it's nice to see the lower price.

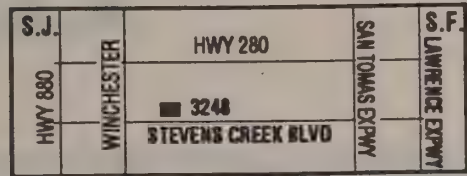
NEW DESKTOP

The Mega STE and the TT both have an improved desktop, the graphic interface you see when using the computer. It's getting easier to use and has some special features. It includes a way to search for files, which can be a real help when you forget where a file is. You can also get to files with keys, as well as with clicking on the screen with the mouse. This allows you to create keyboard shortcuts for getting into certain folders and files. ■



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WD95044 40 MB IDE W/KIT	269
TEAC FAST 40 MB IDE 24MS	279
CONNER CP-3044 40 MB IDE	329
NEC 3661 100 MB ESDI	569
NEC 3655 150 MB ESDI	679
NEC 3142 44/65 MB	289
CONNER 100/200 MB	BEST PRICE

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LITE ON 101	\$32
MITSUMI 101	36
MAXI ENHANCED 101	46
MONTEREY 101 CLICK	45
KEYTRONICS 101	44
5001 FOCUS W/CAL	89
FUJITSU 101 KEY	37

MODEMS

2400 BAUD INTERNAL	\$69
2400 BAUD EXTERNAL	99

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VIDEO CARDS

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MONO/COLOR	35
EVEREX SUPER EGA	65
OAK VGA 800x600	75
PARADISE OEM SUPER VGA 1024x768	86
TRIDENT SUPER VGA 1024x768	92
TRIDENT 1 MB VIDEO CARD WINDOWS 3.0 DR.	155
ORCHID PRO DESIGNER II 512K/1 MB	219/259

FLOPPY DRIVES

TEAC 360/720	\$60/62
TEAC 1.2/1.44	68/69
FUJITSU 360/1.2	58/68

INTERFACE CARDS

WD GEN2/27X RLL	\$42/59
WD 1006MM2/SR2	89/109
WD 1007 SE2 ESDI	172
DTC 7280/7287	79/89
DTC 6280 ESDI 1:1	152
1:1 MFM/RLL	68/79
AT I/O (2S/1P/1G)	22
1.44 FD CONT FOR XT	30
RS232 SERIAL CARD	18
PARALLEL PRINTER CARD	15
DUAL GAME I/O CARD	14
XT I/O PLUS	32
XT MULTI I/O	34
ULTRASTAR ULT 32K CACHE ESDI	179

PRINTERS

KX-P1180	\$149
KX-P1191	229
KX-P1124	279
KX-P1624	359
KX-P1524	369
KX-P1695	CALL
KX-P4420 LASER	819
KX-P4450i LASER	1229
KX-P4455 LASER	2095
STAR NX1024 9 PIN COLOR	229
STAR NX2420 24 PIN COLOR	339
HP LASER JET III	1565
HP DESKJET 500	495
HP LASER JET IIP	945

MOUSE

3 BUTTON WITH DR. HALO SOFTWARE	\$36
LOGITECH C-9/BUS	66/74
LOGITECH TRACKMAN	83
LOGITECH WITH WINDOWS 3.0	137
LOGITECH SCANMAN	169

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80387-25 .O	1MX1 ALL SPEED
80387-33 .W	256X9 (SIMM,SIPP) ALL SPEED
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80386-33 .T	CALL
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HARDWARE

BUYERS GUIDE

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EXP 386 / 286 SYSTEM PRICE LIST

MODEL	Basic	Monochrome System price	VGA(1024x768) System price	Options
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* 386/25 (32KB Cache)	1295	1395	1845	40MB HDD 250
386/25	1095	1195	1645	80MB HDD 550
386/20	995	1095	1545	100MB HDD 570
386SX/16	745	845	1295	150MB HDD 850
286/12	495	595	1045	200MB HDD 895
				338MB HDD 1595
				676MB HDD 2395

Basic System Configuration

- 1MB Memory
- Desktop Case
- Real-time Clock
- 230W Power Supply
- Coprocessor Socket
- 1:1 Interleave IDE Cont.
- 1.2MB or 1.44MB Floppy Drive
- 101 Keyboard (Click or non Click)
- 2 Serial / 1 Parallel / 1 Game Port
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-PC Week May 28, 1990-

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- Wide range of drivers
- Trident 8900 Chipset

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- Up to 1024X768 res.
- .28 mm Dot pitch

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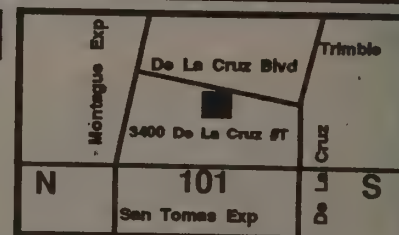
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HARDWARE

BUYERS GUIDE

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Monochrome to VGA(1024X768), 2 to
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-HL6905TK, 20", VGA to 1280X1024N 1999

HITACHI

-CM2085, 20", VGA to 1280X1024N 1949

-HM4319D, 20", VGA to 1280X1024N 1995

-HM4119DDL, 20", 1024X768N 2199

-HM4119DAA, 20", 1280X1024N 2299

NEC

-NEC 4D, 16" VGA to 1024X768N 1199

-NEC 5D, 20" VGA to 1280X1024N 2295

PHILIPS

-C1764, 17" VGA to 1280X1024N (Flat) 1499

-C2064, 20" VGA to 1280X1024N 2095

NANAO

-9070S, 16", 20-50KHz 1024X768N 979

-9400, 20", VGA to 1280X1024 2615

Graphic Card

CONTROL Systems

-XJ10, 1024X768N or 1024X1024I 1695

-XJ12, 1280X1024N or 1024X1024N 1999

METHEUS

-UGA1104, 1024X768, 48.8KHz 895

-UGA1224, 1280X1024, 64KHz 1295

NEC Graphics Engine

-MGE AT/16, 1024X768N, 16 Color 695

-MGE AT/256, 1024X678N, 256 Color 995

Sota Technology

-340i, 1024X768N, 16 Color 695

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-Rendition II/16, 1024X768N 995

-Rendition II/256, 1024X768N 1395

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-IGC20, 1280X1024, TI 34020 1995

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IMAGE-IT is a low cost, yet powerful adaptor. Application for IMAGE-IT include Desktop Publishing, Image Databases, Presentation Graphics and Computer Aided Instruction.

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-Model 730GS Flatbed Scanner 925

-Model 830 Flatbed Scanner 1995

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-Page Scanner with 16 grey 665

MICROTEK LAB

-MSF-300G 300 dpi Gray 1495

-MSF-300Z 16 mil Col, 256 Gray 1985

-MSF-400GS 400 dpi Gray 2895

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Plotter

CALCOMP

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-1025, A-E, 8 Pen 4575

-1044GT, A-E 8895

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-DMP61, A-D 2999

-DMP62, A-E 3999

-Option for Multipen 469

IOLINE

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-3700, A-E, Cut & Roll 2999

-4000, A-E, 20 ips 3499

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-HP7440A, A, 8pens 1095

-HP7475A, A-B, 6 pens 1450

-HP7550A, A-B, 8 pens 2995

-HP7570A, C-D, 8 pens 2995

-HP7575A, A-D, 8 pens 3695

-HP7576A, A-E, 8 pens 4795

-HP7595B, A-E, 8 pens 6695

ENCAD Plotter

-SP600, A-B, 6 pens 695

-SP1800, A-D, 8 pens 3435

-SP2800, A-E, 8 pens 4365

-SP4810, A-C, Cut, Roll 3595

Digitizer

SUMMAGRAPHICS

-SummaSketch II 12x12 369

-SummaSketch II Pro 639

KURTA

-12X12, Cur. & Stylus 389

-12X17, Cur. & Stylus 649

CALCOMP

-12X12, Cur. & Stylus 329

-12X18, Cur. & Stylus 655

-18X24, Cur. & Stylus 1325

-24X36 (2300 Series) 1595

-36X48 (2300 Series) 1795

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RESOURCES

Calendar Of Events

JANUARY

January 21-22 Moving From Mainframes To PCs—The Downsizing Conference. San Francisco. Digital Consulting. Call: (508)470-3880.

January 21-25 USENIX Technical Conference. Dallas. USENIX. Call: (714)588-8649.

January 22 Forum: An Evening With Ashton-Tate. San Francisco. Software Training Group. Call: (415)397-4158.

January 22 Intro To Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

January 22 WordPerfect For Windows Demonstration. San Francisco. San Francisco Business Computers. Call: (415)788-5338.

January 22-23 Quattro Pro Session 1 Class. Santa Clara. Training Works. Call: (408)287-8827.

January 22-24 Sixth International Conference On Multimedia And CD-ROM. San Francisco. Microsoft. Call: Mark LoGiurato, (203)352-8224.

January 22-25 Optimizing/Customizing AutoCAD, Level II Class. San Francisco. State University Extended Education. Call: (415)338-1205.

January 23 PC-Mac Business Correspondence Class. San Rafael. Bay Area Computer Training. Call: (415)507-0384.

January 24 Intro To Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

January 24-25 Mastering The Macintosh Seminar. San Francisco. US Professional Development Institute. Call: (301)445-4400.

January 25 Intro To MS Works Database Class. San Francisco. Computer Alliance. Call: (415)771-1671.

January 25 MS Excel Class. San Francisco. Training Works. Call: (415)243-0100.

January 26 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

January 28 Harvard Graphics Class. San Francisco. Training Works. Call: (415)243-0100.

January 28 Time Line Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

January 28 Ventura Publisher For Windows Presentation. San Francisco. SFPC User Group. Call: (415)221-9166.

January 28-29 Quattro Pro Session 2 Class. Santa Clara. Training Works. Call: (408)287-8827.

January 29 Microsoft Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

January 29 Networking—Appletalk On The Mac Class. San Rafael. Bay Area Computer Training. Call: (415)507-0384.

January 29-30 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

January 29-31 Software Maintenance: The Business Of Change Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

January 29-February 21 Basic AutoCAD, Level I Class. San Francisco. State University Extended Education. Call: (415)338-1205.

January 30 Lotus Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

January 31-February 1 Animator Class. San Francisco. State University Extended Education. Call: (415)338-1205.

January 31-February 1 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: (415)442-0200.

FEBRUARY

February 1 Advanced DOS Class. Santa Clara. Training Works. Call: (408)287-8827.

February 1 Microsoft Windows Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

February 2 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

February 4 Microsoft Word Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 4 MS-DOS For AutoCAD, Level II Class. San Francisco. State University Extended Education. Call: (415)338-1205.

February 4-5 Windows Class. Santa Clara. Training Works. Call: (408)287-8827.

February 5 Plan, Manage & Communicate Seminar. San Francisco. Symantec Training Group. Call: (415)898-1919.

February 5-6 Distributed Data Bases And Cooperative Processing Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 6-8 Time Line Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

February 7 Microsoft Excel Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 7 Paradox Class. San Francisco. Training Works. Call: (415)243-0100.

February 7 Using HyperCard Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 7-9 Digital '91 Photography Conference. Dallas. NPPA. Call: 1-800-527-4727.

February 7-28 Intro To Microcomputers Using The Personal Computer Class. San Francisco. State University Extended Education. Call: (415)338-1205.

FEBRUARY 27

NEW WAYS TO LOOK AT COLOR: DIGITAL COLOR PREPRESS SEMINAR

HOTEL NIKKO, SAN FRANCISCO

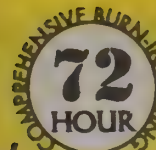
Intended for commercial printers, service bureau managers, color separators, and others involved in the color prepress process, Agfa Compugraphics and Adobe Systems are jointly presenting a seminar on PostScript language color prepress in San Francisco on February 27. Beginning with a review of the essentials for understanding digital color prepress, the seminar will also discuss PostScript language color, including halftones, halftone angles, PostScript language Level 2, and Adobe's new Emerald raster image processor. A final session will investigate a prepress environment with UNIX- and Macintosh-based systems, imagesetters, off-press proofing systems, and training. Seating is limited; for more information, call: Agfa, 1-800-227-2780



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Microcom 286/16 Systems (1 MB RAM)..... Add \$50

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Hard Drives:	IDE	IDE	IDE	IDE	ESDI
MB/Ms	42/25	80/18	105/18	205/15	340/16
Mono	\$699	\$899	\$949	\$1,299	\$2,099
Super VGA	\$999	\$1,199	\$1,249	\$1,599	\$2,399
Hires	\$1,049	\$1,249	\$1,299	\$1,649	\$2,449

Microcom 386SX/16 Systems (1 MB RAM)

Standard System, Hard Drive, Monitor & Video Card

Hard Drives:	IDE	IDE	IDE	IDE	ESDI
MB/Ms	42/25	80/18	105/18	205/15	340/16
Mono	\$999	\$1,199	\$1,249	\$1,599	\$2,399
Super VGA	\$1,299	\$1,499	\$1,549	\$1,899	\$2,699
Hires	\$1,349	\$1,549	\$1,599	\$1,949	\$2,749

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Standard System, Hard Drive, Monitor & Video Card

Hard Drives:	IDE	IDE	IDE	IDE	ESDI
MB/Ms	42/25	80/18	105/18	205/15	340/16
Mono	\$1,149	\$1,349	\$1,399	\$1,749	\$2,549
Super VGA	\$1,449	\$1,649	\$1,699	\$2,049	\$2,849
Hires	\$1,499	\$1,699	\$1,749	\$2,099	\$2,899

Microcom 386/33C Tower Systems (1 MB RAM/64K Cache)

Standard System, Tower Case, Hard Drive, Monitor & Video Card

Hard Drives:	IDE	IDE	IDE	IDE	ESDI
MB/Ms	42/25	80/18	105/18	205/15	340/16
Mono	\$1,499	\$1,699	\$1,749	\$2,099	\$2,899
Super VGA	\$1,799	\$1,999	\$2,049	\$2,399	\$3,199
Hires	\$1,849	\$2,049	\$2,099	\$2,449	\$3,249

Microcom 486/25C Tower Systems (4 MB RAM/128K Cache)

Standard System, Tower Case, Hard Drive, Monitor & Video Card

Hard Drives:	IDE	ESDI	IDE	ESDI	ESDI
MB/Ms	105/18	150/18	205/15	340/16	650/16
Hires	\$3,049	\$3,449	\$3,399	\$4,199	\$5,149

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Hard Drives:	IDE	ESDI	IDE	ESDI	ESDI
MB/Ms	105/18	150/18	205/15	340/16	650/16
Hires	\$3,749	\$4,149	\$4,099	\$4,899	\$5,849

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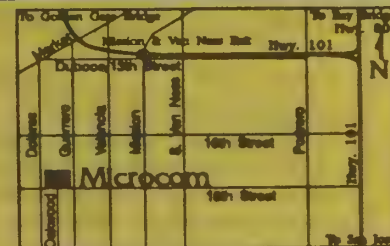
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286/12 Super VGA Special

\$949

286/16 Super VGA Special

\$999

- * 286/12 or 286/16 Standard System
- * 42 MB Hard Disk w/25 ms Access Time
- * Super VGA 800 x 600 Graphics Card
- * 14" Color Hires Monitor (Up to 1024 x 768 Resolution)
- * Add \$50 for 16-bit Hires 1024 x 768 Graphics Card w/512 KB

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286

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- * 386SX/16 Standard System
- * 42 MB Hard Disk w/25 ms Access Time
- * Super VGA 800 x 600 Graphics Card
- * 14" Color Hires Monitor (Up to 1024 x 768 Resolution)
- * Add \$50 for 16-bit Hires 1024 x 768 Graphics Card w/512 KB

386 POWER

386SX

286 PRICE

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386/25 Super VGA Special w/42 MB Hard Disk

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386/25 Super VGA Special w/105 MB Hard Disk

\$1,699

- * 386/25 Standard System
- * 42 MB or 105 MB Hard Disk
- * Super VGA 800 x 600 Graphics Card
- * 14" Color Hires Monitor (Up to 1024 x 768 Resolution)
- * Add \$50 for 16-bit Hires 1024 x 768 Graphics Card w/512 KB

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32-BIT POWER

32-BIT POWER

32-BIT POWER

32-BIT POWER

386DX

386/33C Super VGA Tower Special

\$1,999

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- * 105 MB Hard Disk w/Quick 18 ms Access Time
- * Super VGA 800 x 600 Graphics Card
- * 14" Color Hires Monitor (Up to 1024 x 768 Resolution)
- * Add \$50 for 16-bit Hires 1024 x 768 Graphics Card w/512 KB

MICROCOM

32-BIT POWER

32-BIT POWER

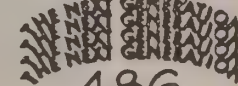
32-BIT POWER

386DX

486/25C Hires Tower Special

\$2,999

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- * 105 MB Hard Disk w/Quick 18 ms Access Time
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- * 14" Color Hires Monitor (Up to 1024 x 768)



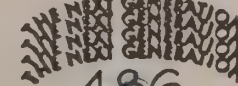
486

MICROCOM

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- * 105 MB Hard Disk w/Quick 18 ms Access Time
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- * 14" Color Hires Monitor (Up to 1024 x 768)



486

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Calendar Of Events *continued*

February 9 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

February 9 Intro To Graphics Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 9 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

February 9-17 AutoLISP, Level I Class. San Francisco. State University Extended Education. Call: (415)338-1205.

February 11 Q&A Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

February 12 Novell For The End-User Class. San Francisco. Training Works. Call: (415)243-0100.

February 12-13 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

February 12-14 NetWorld '91. Boston. NetWorld. Call: 1-800-444-3976.

February 12-15 Software Development '91 Conference. Santa Clara. Software Development Seminars. Call: (503)624-2118.

February 13-14 MS Word For Windows Class. Santa Clara. Training Works. Call: (408)287-8827.

February 14 Adobe Illustrator Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 14-15 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: (415)442-0200.

February 16 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

February 16 Hard Disk Management Techniques For Your IBM PC, XT, Or AT Class.

San Francisco. State University Extended Education. Call: (415)338-1205.

February 17 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

February 19 Adobe Illustrator 88 Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 19 Microsoft Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 20 Foxbase Class. San Francisco. Training Works. Call: (415)243-0100.

February 20-22 The Sixth Annual Image Scanning Conference. Monterey. BIS CAP International. Call: (617)982-9500.

February 21 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

February 21 DOS Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

February 21 Lotus 1-2-3 v2.2 Class. San Francisco. Training Works. Call: (415)243-0100.

February 21-22 First Industry Symposium On Virtual Worlds Technology. Seattle. Human Interface Technology Lab. Call: (206)543-5075.

February 22 Intro To MS Works Database Class. San Francisco. Computer Alliance. Call: (415)771-1671.

February 23 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

February 25 FileMaker Pro Part 1 Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 25-26 Downsizing: Gearing Up To Move Down Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 25-March 1 Compcon Spring '91 Conference. San Francisco. IEEE Call: (202)371-1013.

February 25-March 1 Data Base: A Builders Guide Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 25-27 Time Line Workshop. San Francisco. Symantec Training Group. Call: (415)898-1919.

February 26-27 Quattro Pro Session 1 Class. Santa Clara. Training Works. Call: (408)287-8827.

February 26-28 New Office Strategies For The 1990s: Client-Server, Integration, LANs,

& GUIs Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

February 26-March 1 LAN Troubleshooting With Hands-on Ethernet Workshop. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

February 27 FileMaker Pro Part 2 Class. San Francisco. Abacus Training. Call: (415)759-9508.

February 27 New Ways To Look At Color: Digital Color Prepress Seminars. San Francisco. AGFA And Adobe Systems. Call: 1-800-227-2780.

February 27-28 Novell For System Administrators Class. San Francisco. Training Works. Call: (415)243-0100.

February 28 Adobe PhotoShop Part 2 Class. San Francisco. Abacus Training. Call: (415)759-9508.

MARCH

March 2 AutoCRAM Workshop. San Francisco. State University Extended Education. Call: (415)338-1205.

March 3 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

March 4 MS-DSO For CAD Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 5-6 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

March 5-7 Windows & OS/2 Conference. San Jose. CM Ventures. Call: (415)601-5000.

March 7 & 14 MacroMind Director Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 7-8 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: (415)442-0200.

March 7-May 9 Programming In C Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 9 AutoCAD Operator Certification Examination. San Francisco. State University Extended Education. Call: (415)338-1205.

March 9 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

March 9-10 CAD For Managers Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 10-12 Amsterdam Virtual Conference. Amsterdam. European Cyber-

MARCH 9-12

FIFTH INTERNATIONAL COMPUTER GAME DEVELOPERS' CONFERENCE

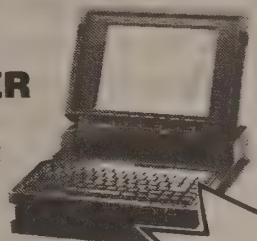
SAN JOSE

The 1991 Computer Game Developers' Conference will present more than fifty seminars, covering a wide variety of topics including artificial character development, creativity, and self-publishing in lectures and discussion sessions. Creative people from all over North America, Europe, Japan, and Australia are expected to attend to exchange views and opinions and to hear the industry's leading game designers and engineers speak. For more information, contact: Computer Game Developers' Conference, 5339 Prospect Rd., Suite 289, San Jose, CA 95129. (408)946-4626.

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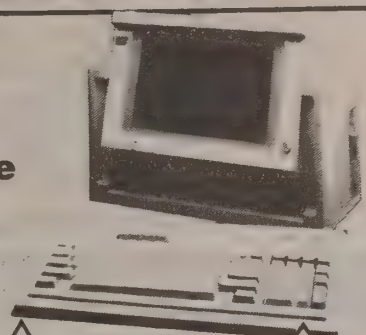


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- Parallel Printer Port
- External Monitor Port
- Soft carrying bag-optional

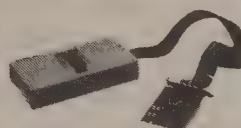


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CGA**

**\$1295
VGA**

EXPRO-40 PC-Based Universal Device Programmer & Tester

\$495



PC Adapter Card

Dtype 37 Pins Cable

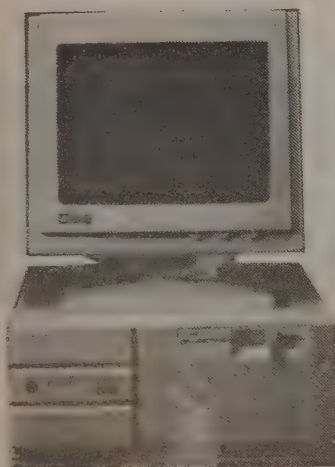
8 SOFTWARES AVAILABLE FOR POPULAR DEVICE PROGRAMMING
EPROM: NMOS or CMOS EEPROM: 2816, 17A, 64A, 256A. BROM: From 32x 8 to 4096 x 8 Bipolar PROM MMI, NS, Signetics, TI, AMD, Motorola, Harris, Cypress; MPU 8748: 8748, 48H, 49H, 41A, 42H, 41AH, 42AH, 48AH, 49AH; MPU 8751: 8751H, 52H, 44H, 51BH, 52BH, C51, C252, PAL, EPLD, GAL, CMOS PAL: MMI, NS, TI, AMD, Cypress, Lattice, 16R8, 20V8, 20L10, 22G10, 16V8, 20V8.

IC Tester: 74xx, 40xx, 45xx, DRAM

EPROM PROGRAMMERS

High Speed 8M EPROM Programmer HEP-808	\$25
EPROM Programmer, EW-901B (1 Port)	95
EPROM Programmer, EW-904B (4 Ports)	125
EPROM Programmer, EW-701 (1 Port)	125
EPROM Programmer, EW-704 (4 Ports)	160
EPROM Programmer, EW-708 (8 Ports)	235
EPROM Eraser (with Timer, 15 Chips)	90
EPROM Programmer, BW-601 (1 Port)	185
PAL Programmer PAW-401	235
8748/49 Programmer UPW-481	155
IC Tester (IC-302, TTL, CMOS, DRAM)	125
EPS-011 Expansion Slot (4 Ports)	39

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- AT Case w/230 W PS
- 101 Keyboard

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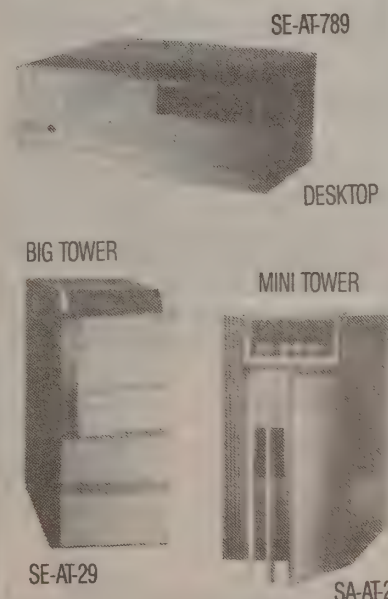
w/9" Monitor (720x350 TTL)
200W Auto-Switch PS. \$345

Floppy Drives: TEAC, Toshiba, Fujitsu
Hard Drives: Seagate, Microscience
Monitors: NEC, Sony, Relisys, Nanao ADI
Printers: Epson, Star, Panasonic, HP LaserJet
Mice/Scanners: Logitech C9, Trackman, Scanman Plus
Keyboards: Maxi, Omnikey, Monterey, Ampttron
Modems: Everex, Telemodis
DRAMS/Math Co-Processors: CALL
ADD ON CARDS: ALL KINDS

NOVELL® NETWORKING

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LAN Network Interface Cards:	
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Calendar Of Events *continued*

space Congress. Call: 31-20-203219, Fax: 31-20-253280.

March 11 Q & A Workshop. San Francisco. Symantec Software Corp. Call: (415)899-8265.

March 11-13 Sixth Annual Computers In Libraries Conference And Exhibition.

Oakland. Computers In Libraries. Call: Kim Devan, 1-800-635-5537.

March 12 Intro To Macintosh Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 12-14 Managing The Dictionary/Repository Seminar. San Francisco. Technology Transfer Institute. Call: (213)394-3805.

March 13 Using FreeHand Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 13-15 FMS/AC (CAD Facility Mapping) Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 13-15 Time Line Workshop. San Francisco. Symantec Software Corp. Call: (415)899-8265.

March 16 Building APC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

March 21 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

March 21 HyperCard Scripting Part 1 Class.

San Francisco. Abacus Training. Call: (415)759-9508.

March 22 Intro To Novell Class. San Francisco. State University Extended Education. Call: (415)338-1205.

March 23 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

March 25 MS Word For Beginners Class. San Francisco. Abacus Training. Call: (415)759-9508.

March 25-28 DB/Expo 91: Emerging Technologies For The '90s. San Francisco. Norm De Nardi Enterprises. Call: 1-800-2DB-EXPO.

March 25-28 First Conference On Computers, Freedom & Privacy. Burlingame. Computer Professionals For Social Responsibility. Contact: 345 Swett Rd., Woodside, CA 94062.

March 30 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

MARCH 18-20

THE SIXTH INTERNATIONAL CONFERENCE & EXPO ON MULTIMEDIA AND CD-ROM: PROGRESS AND PROMISE

SAN JOSE CONVENTION CENTER

Sponsored by Microsoft, the Multimedia and CD-ROM Conference & Expo will focus on where the market is and where it is going. Beginning with a keynote address from Bill Gates and continuing through a closing presentation about the future, the conference is organized along three tracks: Technology/Design explores product and interface designs; Business/Marketing Distribution examines market opportunities, financing, niche marketing and more; and Corporate Solutions provides key studies on such issues as applications, integration, documentation and networking. CD-ROM & Multimedia Registration, c/o Galaxy Registration, Inc., PO Box 3379, Fredrick, MD 21701. 1-800-255-7798.

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386-20 225
286-12 w/ cpu 99

MATH COPROCESSORS

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387SX-16 283
387-20 Intel 338
387-25 422
387-33 522

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COMPUTER SYSTEMS SPECIAL THIS MONTH

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486TM -25MHZ \$2049
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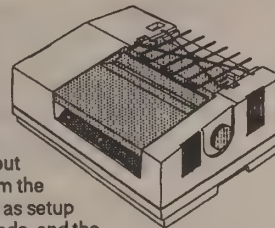
Tel (408) 954-8188
Fax (408) 954-0944

February is Potpourri Month at HSC!

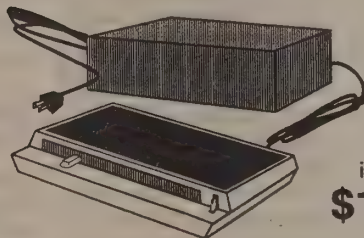
This is just a sample of our varied inventory...Check out these Silicon Valley Values!

Color Printer for the Dedicated Hacker...

This unit (made for Ramtek by Shinko, Japan, model # CHC-33) is for the serious hacker only...come on, we know you are out there! For starters, it is 220VAC! That is not too hard to overcome. It takes RGB+ Sync video supplied to four BNC connectors for the input (again, not too hard, for the technically astute). This thermal-transfer method printer features a fixed 800 element thermal print head (no ink-jets to clog, no moving head to adjust!), and uses a full-width acetate "ribbon" that has yellow, magenta and cyan areas on it. It prints on plain tractor-feed paper or overhead projector film by moving it past the print head three times, once for each color. The print resolution is 4 dot/mm or about 100 dots/in. The color ribbons are available through an address we provide you. Also provided is a 70-page extract from the huge technical manual we were able to locate for this unit. It includes technical specifications and schematics, as well as setup and use instructions. These units are new in the box, measure approximately 18.75" x 16" x 7.75", weigh about 44 pounds, and the best part is we can sell them to you for only \$175.00!



\$175.00



Cable TV Converter has wealth of parts...

...including a varactor tuner, 36-position slide switch, RF modulator, power supply, etc. These units, made by Hamlin (model # MCC-4000-3) are definitely used, and show it, but they are all tested working, so you are assured good parts. Of course, these are not for use as a means to receive free cable TV! You will need to talk to your local cable company for service, but if you are looking for a treasure trove of RF type parts, this is your type of item, at only \$10.00! Sorry, we have no documentation.

\$10.00

It's Back, but even Bigger and Better!

You may remember the Yuasa NP6-12 Maintenance-Free Rechargeable 12V 6AH Battery that we advertised for \$13.95 a little while back. Well, here is your chance to double up on that capacity without doubling up on price! We just received a load of Yuasa NP12-12 batteries, rated at 12V 12 Amp-Hour, with 1989 manufacture-date codes and 1990 test-date codes. They are not quite double the size, at 4" x 4" x 6", and weigh just under 9 lbs. The 1/4" spade terminals show signs of prior connection, but since they were shipped in the original manufacturer's crates, we believe this is just evidence of the testing company. They look new to us! Best of all, they are only \$22.95! Hurry, these will go even faster than the others!



\$22.95

Does your Hard Drive need a home?

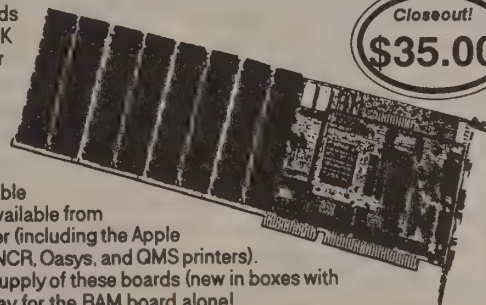
How about your CD-ROM Drive? Or your Tape Back-up? Floppy Drives? Eventually, if you keep adding drives to a system, you run out of places to put the drives! External drive enclosures are the only way to go, but they have not been attractively priced until now. HSC just acquired a large shipment of used external drive enclosures that will allow you to house all of your computer's drives without mortgaging your house! These units measure 8" x 5 1/2" x 15" and features a 40-Watt switching power supply with two drive connectors, 3" cooling fan, and room for one full-height or two half-height 5 1/4" drives. They are finished in a beige-and-grey color scheme similar to the original IBM XT or AT (and thus about 99% of all clones!), but as they are used, there may be minor blemishes. You will need to provide your own data interconnect cable, but a standard IEC power cord is included. You have seen these types of enclosures advertised elsewhere at close to \$100.00, but we're offering these at less than half that! Hurry, they won't last long!



\$49.00

Take Control of your Laser Printer & increase your AT's RAM!

If you own an original (6 MHz) IBM AT and an older HP Laser Jet printer with non-upgradeable memory and no down-loadable font capability, you know how limiting and slow that is! And if your AT only has 512K or even 640K of RAM, you probably wish you could take full advantage of software packages that use the LIM EMS standard for Expanded Memory. Now you can solve both problems and only use up one system slot with Tall Tree Systems' JRAM AT-3 EMS RAM Expansion boards with the J-Laser Plus controller. The JRAM AT-3 Board will hold up to 2 Megabytes of 256K DRAM chips (not included), and can be configured to add the memory anywhere in your system (even "on top" of other banks of RAM you may have installed). You can install up to four JRAM boards in a system. You also get the Tall Trees software package which includes the device drivers for the RAM board as well as RAMdisk and print-spool software. The real plus to this deal, however, is the J-Laser Plus Laser Printer Controller module. This unit assumes control of your laser printer engine and uses its JRAM memory to speed up and enhance your laser printing capabilities. It even works with Bitstream Fontware downloadable fonts for an expanded font library! You need a special interface cable (not supplied, but available from TallTree Systems) which hooks up inside your Canon LBP-CX or LBP-SX engine laser printer (including the Apple Laserwriter, HP LaserJet, LaserJet Plus and Series II, and various Canon, Cordata, Imagen, NCR, Oasys, and QMS printers). It even has an input for a Canon IX-12 Scanner! Now the best part...we still have a limited supply of these boards (new in boxes with 0K RAM) available at a closeout price of \$35.00! Less than half of what you'd expect to pay for the RAM board alone!



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(408)448-1126. 24 hrs., 300/1200/2400. Fido Node #1:143/302. 12 Step Programs including AA, NA, CA, GA, AI-Anon. Echos: Recovery, 12 Step, OASIS and others. Sysop: Mike R. [Exp. #78.]

Consumers BBS And Insurance Center. (408)378-0626. 24 hrs. Rate your own auto insurance. Buy/sell a car. Shop in our garage sale. See if your car has been recalled. Sysop: David McCoy. [Exp. #80.]

Cruzio. (408)423-9995. 1200/2400. If dialing in @ 1200 baud, send Ctrl-C on connect. Serving local Santa Cruz Co. with calendar, directory, conferencing, email and USENET newsgroups. Sysop: Chris Neklason and Peggy Dolgenos. [Exp. #80.]

Dirt Alert OHV BBS. (408)247-3229. 8-N-1, 24 hrs., 300/600/1200/2400. Text only OHV environmental activists BBS for the protection and preservation of Off Highway Vehicle areas. [Exp. #81.]

Diversified I/O BBS. (408)745-7026. 8-N-1, 24 hrs., 300/1200/2400. Product info and tech support for Diversified I/O Macintosh software. Sysop: Diversified I/O, Inc. [Exp. #79.]

Doghouse BBS. (408)997-7352. 300/1200/2400. An Atari BBS. Sysop: Dave Sillas. [Exp. #78.]

Hognet. (408)732-8958, 248-4736. 8-N-1, 300/1200/2400. Sysop: Alison Denu (Hog-I), Bruce Grembowski (Hog-II). [Exp. #78.]

Lynn-Western Newswires. (408)778-5994 & 778-9656. 8-N-1, 24 hrs., 1200/2400. FidoNet 1:143/304. Professional information on technology, management, and worldwide investment news. Stock Market data online. [Exp. #80.]

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Macrocosmic BBS. (408)985-0773. 8-N-1, 24 hrs., 300/1200/2400. Hundreds of megabytes of files for the Macintosh. Sysop: Robert D. Matthews. [Exp. #80.]

P.I.E. (Programming And Interfacing Enthusiasts) BBS. (408)733-4670. Sysop: Clay Walker. [Exp. #78.]

Ring-Of-Fire. (408)453-3326. 24 hrs., 2 nodes. Silicon Valley Novell Users and United Sysop's Association. Online games. Active since 1982. [Exp. #80.]

SCV-TICP, Silicon Valley Refuge of TI Pro Users. (408)296-2503. 8-N-1, 24 hrs., 300/1200/2400. Sysop: Mark Cantrell. [Exp. #81.]

The Coral Reef BBS. (408)449-6346. 300—38400. Multiline. Sysop: David Fogle. [Exp. #78.]

The Moose Is Loose BBS. (408)773-9573. 1200/2400/9600. The best msg. base under Sunnyvale's fruit can. Sysop: John Giever. [Exp. #80.]

The Silicon Matchmaker. (408)248-6062. 24 hrs., 300/1200/2400. Electronic PenPal network. Twelve lines. [Exp. #80.]

Vietnam Veterans Valhalla. (408)298-2740. 8-N-1, 24 hrs., 300/1200/2400/9600. FidoNet 1:143/27. Veterans' benefits, International EchoConference, NAMVET Newsletter, Recovery system. [Exp. #79.]

415

& the Temple of the Screaming Electron. (415)935-5845. Raw data for raw nerves, home of NIRVANAnet(tm). Sysop: Jeff Hunter. [Exp. #79.]

AIDS Info BBS. (415)626-1246. 8-N-1, 24 hrs., 1200/2400. 25Mb dBASE with index, keyword search, online help instructions, no chat. Topics on AIDS including read/write discussions, articles, stats, resource contacts, and private email between users. Text only. Sysop: Ben Gardiner. [Exp. #80.]

All Antique Radio BBS. (415)491-0214. 8-N-1, 24 hrs., 300/1200/2400. [Exp. #78.]

Amiga Barber Shop. (415)261-1001. 24 hrs., 1200/2400. 53Mb all Amiga files. Sysop: Blade. [Exp. #80.]

Anatomically Correct BBS. (415)967-4265. 2400. Free, adults only, unique "chat." Sysop: Howieird. [Exp. #80.]

Art/Online! BBS. (415)255-7045. 8-N-1, 300/1200/2400/9600. Forum for all interested in Fine Art, new artists and novices welcome, ansi color support. Sysop: Jim Raridan. [Exp. #78.]

BBS Of San Francisco Apple Core. (415)563-8652. 24 hrs.,

2400. Lots of fun, supports Apple II and GS computers. [Exp. #80.]

Bizarre Bazaar BBS. (415)821-4832. 300/1200. WWIV 4.12 software, bilingual (Esperanto) message base and uploads. [Exp. #80.]

Breaking Walls; Building Bridges. (415)827-0804. 24 hrs., 300/1200/2400. Church, gays/lesbians, community, AIDS. Forums, news, confidential mail, care. Sysop: Deacon DVMCC. [Exp. #80.]

Bultenejo Bizara Bazar. (415)821-4832. 300/1200. Programaro WWIV 4.12. Dulingvaj mesagharoj kaj sharghfakoj. Ankau komputiloj estas verdaj! [Exp. #80.]

C.O.W. BBS. (415)359-5975. 24 hrs., 300/1200. Commodore and Amiga oriented user group. Sysop: Steve Beale. [Exp. #78.]

California ConneXion Partyline. (415)927-2739. 8-N-1, 24 hrs., 300/1200/8400. 300Mb, 9 lines, chat, worldwide network, 25+ pubs, matchmaking, adults only. Reg. required. [Exp. #79.]

Castle Of Blackthorn. (415)638-2937. 24 hrs., 300/1200/2400. Files & msg. bases for Atari, IBM, Mac, and Commodore. Over 19 online games. Sysop: Blackthorn and British. [Exp. #80.]

CIN-SF Network. (415)239-7925. Free, files, good discussions, topics include politics, social issues, ethics and religion. Sysop: Hugh O'Regan. [Exp. #78.]

Compact Disc Exchange. (415)824-7603. 24 hrs., 300/1200/2400. Online CD exchange network. Buy/sell used CDs and collectable discs. Voice: (415)826-9350. Sysop: Wayne Gregori. [Exp. #78.]

Computer Playground. (415)969-3823. 8-N-1, 300/1200/2400. Concentrating on educational uses and software for IBM, Amiga and Macintosh computers. [Exp. #78.]

CWEST Color Commodore. (415)552-9320. [Exp. #80.]

Destroyer Direct BBS. (415)871-2238. Commodore GFX or 8-N-1 ANSI, 24 hrs., 300/1200/2400. Online games, dating, classified, audio-video, more! [Exp. #78.]

E-MAP/MapNet. (415)256-6551. 24 hrs., Street directions, address to address in the USA and Canada. [Exp. #80.]

Freedom BBS. (415)683-9560. 24 hrs., 300/1200/2400/9600. Political bulletin board. All views aired and accepted. Intelligence is a prerequisite. Sysop: Dennis H. Medley. [Exp. #80.]

Guideboard. (415)864-3858. 24 hrs., 300/1200/2400. Multi-line,

Cabbie's Guide to SF. Where to go for restaurants, doctors, auto repair, etc. Sysop: Dick Schwartz. [Exp. #78.]

HTG/Outreach BBS. (415)572-9594. 8-N-1, 24 hrs., 300/1200/2400. High tech gays/lesbian/bisexual/transgender, 4-line, TBBS, security clearance info, activities calendar, GGBA electronic dictionary, echo conf, CB chat, files, free & open access. Sysop: Sagittarius. [Exp. #80.]

Jobs-on-line. (415)324-3780. 8-N-1, 300/1200/2400. 16-line High-tech Employment/Business, opportunity search service. [Exp. #78.]

Just Say Yes! Freedom Of Information. (415)922-2008. Home of NIRVANAnet(tm). Sysop: Dr. Strangelove. [Exp. #78.]

MacCircles BBS. (415)484-4412. 8-N-1, 24 hrs., 9600. FidoNet echoes, USENET newsgroups, local conversations, files, games. Two open lines, all welcome. Sysop: Patricia O'Conner. [Exp. #80.]

Nightingale. (415)292-7314. FidoNet 1:10/475 Signet 26:1415/0. A general nursing BBS, open to all. "Medfiles", medical and nursing echomail, and "Medware" continuing education programs. Sysop: Jim Rankin. [Exp. #78.]

Opportunity Network BBS. (415)673-4080. Jobs/Candidates for computer professionals. Voice, (415)673-0802. Sysop: Kathleen McMahon. [Exp. #78.]

Over My Dead Body BBS. (415)465-7739. 8-N-1, 24 hrs., 300/1200/2400. RBBS system for mystery fans. Sysop: Cherie Jung. [Exp. #80.]

Palo Alto Writer's Most Echoes OPUS. (415)322-6451. 6:00 pm-8:00 am. Echo areas: writing, and words/words. No charge. A few shareware files. Moving to 9600 bps soon. [Exp. #80.]

Quasatron BBS. (415)734-0444, 551-0134. 8-N-1, 24 hrs., 300/1200/2400. Games, utils, adult files. [Exp. #78.]

Rathead. (415)524-3649. Home of NIRVANAnet(tm). Sysop: Ratsnatcher. [Exp. #78.]

Recovery BBS. (415)223-1119. 300-9600. AA, NA, AI-Anon/ACA, SLAA. Recovery and 12 Step Echos. Fido 125/9. Sysop: Rich Gorlin. [Exp. #80.]

Running Wyld. (415)368-5685 (9600); 365-9079 (2400). Graphic image center, 500Mb. Sysop: [Exp. #78.]

Scubanet BBS. (415)566-0385. 8-N-1, 24 hrs. Dedicated to divers. Sysop: Charlie Eng. [Exp. #78.]

SFPCUG. (415)621-2609. 8-N-1, 300/1200/2400/9600. Email, ul/dl messages, files. Voice: (415)621-1908. [Exp. #80.]

Skeptic's Board. (415)648-8944. Paranormal/fringe science issues, Bay Area Skeptics. Recording, (415)LA-TRUTH. Sysop: Rick Moen. [Exp. #78.]

Songtech BBS. (415)770-9655. 24 hrs., Computer store, IBM software and hardware. [Exp. #78.]

StarComm BBS (415)922-5628. 300/1200/2400. ANSI/NON-ANSI, MS-DOS compatibles system, online games, file sharing, 20Mb of downloadable files. Sysop: Starbuck. [Exp. #80.]

Starnet Connections. (415)949-3133. 8-N-1, 24 hrs., 300-19,200. Email, USENET, UNIX, and more. Sysop: Richard Mahn. [Exp. #81.]

SuperResume. (415)524-0416. 8-N-1, 24 hrs., 300/1200. Free features include: Software Engineer Resume Composition Outline, Software Career Strategy Conf., job listings. [Exp. #80.]

The Abyss BBS. (415)482-5813. 24 hrs., 300/1200/2400. IBM/Mac, file & msg base, email. Sysop: Gary Stewart. [Exp. #80.]

The Castle BBS. (415)355-2396. 8-N-1, 2400. Amiga and UFO/Mystic enthusiasts. Voice: (415)355-7111. Sysop: Christopher "StarLord" Coloquon. [Exp. #78.]

The Interlude BBS. (415)458-4344. 8-N-1, 8:00 pm-2:00 am, Wed. to Sun. Matchmaking, singles, personal ads. Sysop: Ed Tausing. [Exp. #80.]

The Job Xchange. (415)226-6160. 24 hrs., 1200/2400. MNP5. An online computer industry system. Free for job seekers and employers. User friendly. Sysop: R. Cassidy. [Exp. #80.]

The KayFun Computer Club. (415)571-9259. 24 hrs., 300/1200/2400. CP/M and DOS, 230Mb storage, online echomail. Sysop: Bob Wallace. [Exp. #80.]

The LAB. (415)753-3238. 24 hrs., Performing, Fine, MIDI and Graphics Arts. Users portfolios, msg bases, and files. [Exp. #80.]

The Machine BBS. (415)345-2353. Amiga SKYPIX or 8-N-1 ANSI, 24 hrs., 300/1200/2400. Sysop: Eric Penn. [Exp. #78.]

The Micro Foundry BBS. (415)598-0498. 1200/2400/9600. IBM PC and compatibles, over 200 new files every week, 2200MB. [Exp. #78.]

The Pilgrim. (415)731-2422. Signet 26:1415/1. "Town Meeting" BBS focusing on current events, spirituality, and issues around homosexuality, from a Catholic perspective. Sysop: Jim Rankin. [Exp. #79.]

The Transporter BBS. (415)441-0616 Rbbs-Net 8:914/209 and SmartNet #5021. Email in over 50 conferences, good discussions. Sysop: Steve Clifford. [Exp. #80.]

VA Listings. (415)744-7793. 24 hrs., 300/1200/2400. VA-owned homes for sale. Sysop: David Piersall. [Exp. #78.]

Viper 1 Premium BBS. (415)535-0231. 8-N-1, 6 pm-midnight, Mon.-Fri., all day Sat. & Sun., 1200. Online games, 42 download areas. Soon to come: online hard disk backup, fax, 2400-38400 bds, and more. [Exp. #80.]

Wetware Diversions. (415)753-5265. 8-N-1, 24 hrs., 1200/2400. Multi-line, PC pursuable, S.F. Public Access UNIX System. Sysop: Christopher Cilley (cc@wet.UUCP). [Exp. #79.]

Wild at Heart! BBS. (415)687-4352. 8-N-1, 24 hrs., closed Sun., 300/1200/2400. MS-DOS NetMail, Commodore 64/128 welcome, comics, baseball cards. Sysop: Steve Rochin. [Exp. #78.]

Windows Online ids. (415)930-8384. 8-N-1, 1200/2400. Everything in Windows. [Exp. #80.]

707

The Power Station. (707)552-0462. 300/1200/2400. Node 2, (707)554-8612; Node 3 (707)645-8780. 415Mb online, supporting IBM and Amiga. [Exp. #78.]

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For Adults Only. (916)944-7861. 8-N-1, 24 hrs., 300/1200/2400. 16 lines, adult fines and contacts. [Exp. #80.]

Potpourri. (916)729-6125, 300/1200/2400. (916)729-7627, 2400/4800/9600. Free, 350Mb, MS-DOS, CP/M, Amiga, Commodore plus technical support. Sysop: Wayne Masters. [Exp. #78.]

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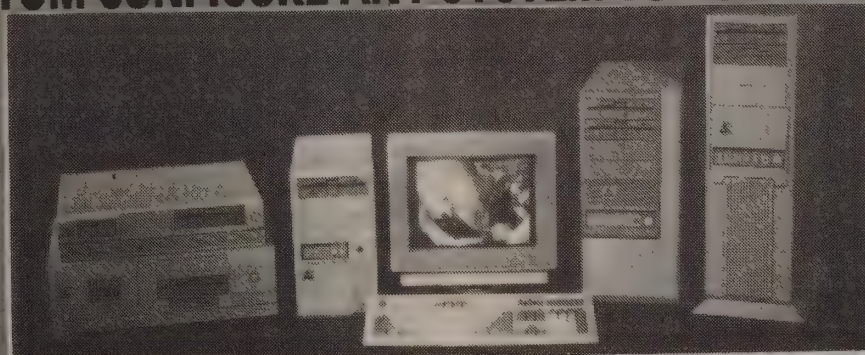
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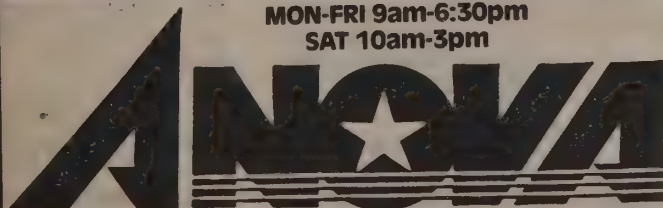
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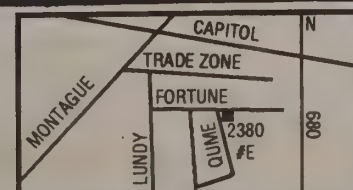
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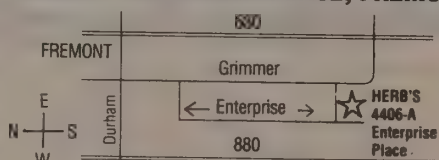
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Independent Computer Consultants Assn. Referral Service. Designed to give public access to the knowledge and experience of Assoc. members, no fee. Call: Referral Service Hotline, (408)980-7272. [Exp. #80.]

Independent Computer Consultants Association. Meet-

ings: 3rd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #80.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #83.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #80.]

United Sysops Association.

Meetings: 2nd Wed, 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (415)453-3321. [Exp. #83.]

Women's Computer Society. Call: Tanya Halepota, (415)949-3936. [Exp. #80.]

Writer's On-line Association Of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #80.]

USER GROUPS

ACCOUNTING

Accounting East Bay User Group. Meetings: 4601 Clipper Ct., Fremont. Call: Phrede Deese, (415)657-5880, BBS (415)795-4268. [Exp. #80.]

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wed., Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #78.]

On-line Accounting Users Group. Call: Bob, (415)686-3304. [Exp. #80.]

San Francisco Bay Area Platinum User Group. Call: Steve Koss, (415)562-2754, or Jim Britton, (415)576-3209. [Exp. #78.]

AMIGA

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary. Call: (415)584-8406. [Exp. #83.]

COW—Commodore Owner's Workshop User Group. Meetings: 3rd Thurs., 7:00 pm, San Bruno Parks & Rec Bldg. No dudes! Call: Steve Beale, (415)355-8927, BBS (415)359-5975. [Exp. #81.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm. Variable. Call: Tibor Horvath, (415)283-5611. [Exp. #83.]

APPLE

Gravenstein Apple IIGS User Group. Meetings: 3rd Sat., 10:00 am, West America Bank, McDowell Ave, Petaluma. Call: (707)763-1428. [Exp. #80.]

San Francisco Apple Core. Meetings: 3rd Tues., 7:00 pm, SF State University, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #83.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm,

program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #78.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #78.]

AT&T Computer Users Group. Meetings: 2nd Wed., 6:30 pm. Refreshments, technical support and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #86.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #78.]

ATARI

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #78.]

COAST (CA Original Atari ST User Group). Meetings: 3rd Wed., 6:45 pm, 550 El Embarcadero, Oakland. The 1st Wed special beginners met for members. Call: (415)945-1949. [Exp. #80.]

South County Atari User Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computers, 1278 Alma Ct., San Jose. Call: C. Ron Reade, (408)225-7162. [Exp. #81.]

CAD/CAM

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #78.]

Marin ACAD User Group. Meetings: 1st Thurs. Call: Gigi Bollinger-Himes, (415)491-4722. [Exp. #80.]

S.F. AutoCAD User Group. Meetings: 1st Mon., 6:30 pm, SFAIA, 130 Sutter St., 6th fl. Call: Katie Price, (415)923-9228.

[Exp. #81.]

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #78.]

Textile Computer Users Group—TCUG. Meetings: Bi-monthly, 1st Sun., 10:00-noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #78.]

COMMODORE

Commodore Hayward User Group (C=HUG). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park, Hayward. Organized to help all Commodore computer users by providing info and demos. Call: Bob Bucy, (415)792-7057. [Exp. #78.]

Cupertino Chapter Of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #78.]

CWEST Commodore 64/128 Users. Meetings: 3rd Wed., Fort Mason. For more information write: 1564 Waller #B, San Francisco, CA 94117. Call: (415)626-9946. [Exp. #83.]

CWEST—Commodore 64/128. Call: (415)626-9946. BBS, (415)552-9320. [Exp. #80.]

dBASE

dBASE IV SIG. Meetings: 1st Tues., 7:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Fletcher Johnson, (408)283-1333. [Exp. #78.]

dBASE SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 333 California St., San Francisco. Call: Mark Webster, (415)647-3675. [Exp. #83.]

SQL_Forum. Meetings: 1st Thurs., 6:30 pm, 394 Pacific Ave., San Francisco. Topics include client/server computing & SQL database servers. Speakers, demos. Call: (415)695-2748. [Exp. #83.]

DESKTOP PUBLISHING

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues.,

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USER GROUPS

6:00 pm, 660 Market St., Ste. 215, San Francisco. Call: Eric Leong, (415)635-0159. [Exp. #83.]

San Mateo Ventura Publisher Users Group. Call: Elinor Cruz, (415)366-5317. [Exp. #81.]

Ventura SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #78.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #80.]

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #80.]

FOCUS

NC FUSE—Northern California FOCUS Users. Meetings: quarterly. P.O. Box 61325, Sunnyvale, CA 94088-1325. Sharing FOCUS knowledge and experience. [Exp. #78.]

GENEALOGY

Contra Costa County Genealogical Society/Computer User

Group. Meetings: 1st Sat. of odd-numbered months. Call: Susan, (415)372-6996. [Exp. #80.]

Contra Costa PAF User Group. Meetings: Last Sat., Call: Susan, (415)372-6996 or Julia, (415)933-6555. [Exp. #80.]

IBM AND COMPATIBLES

Berkeley PC/Compatible User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle, 2618 Telegraph Ave. Call: (415)845-4814 or (415)526-4033. [Exp. #80.]

Columbia SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Call: Bill Boyd, (415)387-2298. [Exp. #79.]

Compatible User Group. Meetings: 2nd Mon., 7:00 pm, Winners Circle Systems, 2618 Telegraph, Berkeley. Call: Mel Mann, (415)526-4033. [Exp. #80.]

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #79.]

Desktop Video SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors \$3. Call: Mike Shurtz, (415)522-1797.

[Exp. #83.]

DESQView SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Visitors \$3. Call: Adam Baum, (415)841-5628. [Exp. #83.]

EastBay FOG. Meetings: 2nd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #80.]

GeoWorks SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors \$3. Call: Larry Yuridin, (415)527-2647. [Exp. #83.]

Golden Gate Computer Society (GGCS). Meetings: 4th Mon. 7:30 pm, San Rafael Community Center. Call: (415)927-2909. BBS (415)927-1216. [Exp. #83.]

Hypertext/Hypervideo SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors \$3. Call: M. Mallicot, (415)922-1587. [Exp. #83.]

Investments SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors \$3. Call: Richard Haven, (415)566-8076. [Exp. #83.]

Lotus 1-2-3 SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm,

UCSF, 3333 California St., San Francisco. Call: Jerry Stern, (415)566-9675. [Exp. #79.]

NBUG, North Bay User Group. Generic computer club for all computer users. SIGs for Mac, IBM, Apple and Commodore, monthly newsletter and p.d. software. Call: (707)644-9327 or 552-0104. [Exp. #79.]

PC BasicS. Meetings: 3rd Mon., 7:30 pm, Micro Age Computers, Sunnyvale. SIG of Silicon Valley Computer Society. Call: (415)326-2435. [Exp. #80.]

PC Clubhouse. Meetings: 1st Fri., 8:00 pm, CSU, Hayward, Room 202, Meiklejohn Hall. To allow computer users to share knowledge and public domain/shareware software. Call: (415)483-9500. [Exp. #78.]

PCjr SIG/SFPCUG. Meetings: 3rd Mon. (if holiday, 4th Mon.), 6:15 pm, UCSF, 3333 California St. Visitors \$3. Call: John King, (415)472-7035. [Exp. #83.]

Peninsula Computer Club—KayFun. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: (415)593-3391 or BBS (415)571-9259. [Exp. #78.]

Professionals SIG/SFPCUG. Meetings: 2nd Thurs., 6:15 pm, Call: Kendall Callas, (415)821-

1310. [Exp. #78.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, Donatello Hotel at Post and Mason. Call: (415)788-5388. [Exp. #78.]

San Francisco PC Users Group. Meetings: 3rd Mon., 7:30 pm, UCSF Laurel Heights, 333 California St., San Francisco. Call: (415)221-9166, BBS (415)621-2609. [Exp. #82.]

San Lorenzo User Group. Meetings: 2nd Tues. and the 20th, 7:00 pm, Gathering Place in Ben Loman, Santa Cruz County. Call: Chuck Schafer, (408)338-7348, BBS (408)335-4672. [Exp. #81.]

Stanford/Palo Alto Users Group For PCs. Meetings: Last Wed., 7:30 pm, Stanford Campus, Jordan Quad, Polya Hall, Turing Aud. Call: (415)329-8252. [Exp. #80.]

WordPerfect SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Visitors \$3. Call: Kendall Callas, (415)821-1310. [Exp. #83.]

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Mac SIG DUAU. Meetings: 3rd Tues., 7:00 pm, Willow Creek Center, 1026 Mohr Lane, Concord. The perfect place for beginners and old timers. Call: (415)676-9905. [Exp. #80.]

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MARKETING

HTEC Marketing SIG. Meetings: 4th Wed., 6:30 pm. Call: Hal Johnson, (415)441-6897. [Exp. #81.]

MULTIMEDIA

Macromind Multimedia User Group And Video SIG. For more information, call: (415)442-6200.

Continued on page 234

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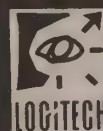
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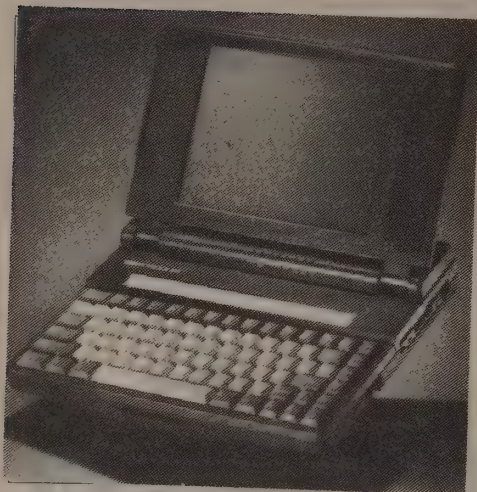
PRODUCT SPOTLIGHT

Continued from page 174

liquid crystal display, the Tempo LX features a non-glare VGA screen that can display sixteen shades of gray in 640 x 480 resolution and up to thirty-two shades of gray in 320 x 200 resolution. The Tempo LX comes with 1Mb RAM expandable to 5Mb, an internal 1.44Mb floppy drive and internal 20Mb hard disk. (\$3899) Everex, Inc., 48431 Milmont Dr., Fremont, CA 94538. (415)498-1111.

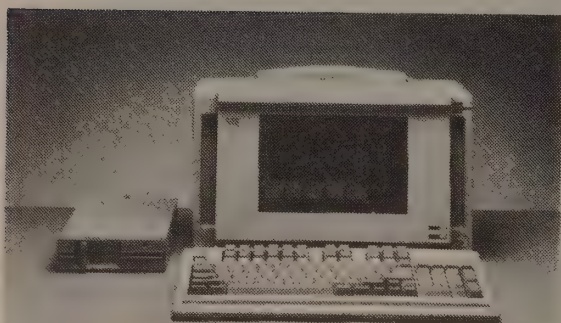
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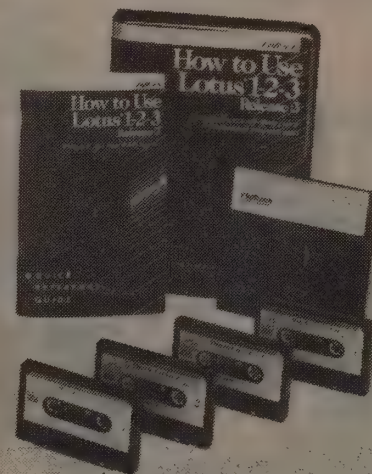


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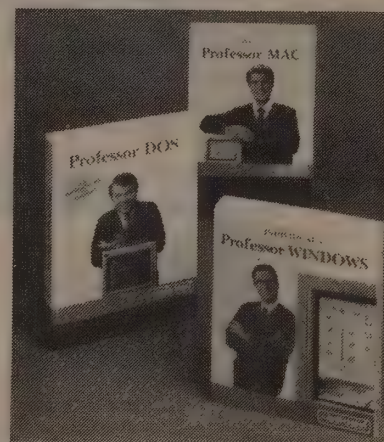
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30/286, 50, 80	512K KIT	30F5348	\$ 200	\$ 49
	2MB KIT	30F5360	\$ 795	\$ 170
55SX	1MB MODULE	6450603	\$ 450	\$ 89
502, 55SX, 65SX	2MB MODULE	6450604	\$ 950	\$ 175
55SX, 65SX	4MB MODULE	34F2933	\$2,195	\$ 549
50,	2-8MB EXP BRD w/2MB	1497259	\$1,350	\$ 575
502,	2-8MB EXP BRD w/4MB	1497259+	\$2,040	\$ 725
55SX,	2-8MB EXP BRD w/6MB	1497259+	\$2,830	\$ 875
65SX	2-8MB EXP BRD w/8MB	1497259+	\$3,620	\$1,025
70-E61,	1MB MODULE	6450603	\$ 450	\$ 89
70-061,	2MB MODULE	6450604	\$ 950	\$ 175
70-121				
70-A21, A61, B21, B61	1MB MODULE	6450603	\$ 450	\$ 89
	2MB MODULE	6450604	\$ 950	\$ 175
	4MB MODULE	6450608	\$ 950	\$ 183
70-All Models	2-8MB EXP BRD w/2MB	6450605	\$1,295	\$ 479
80-All Models	2-8MB EXP BRD w/4MB	6450605+	\$2,890	\$ 629
	2-8MB EXP BRD w/6MB	6450605+	\$4,185	\$ 779
	2-8MB EXP BRD w/8MB	6450605+	\$5,480	\$ 929
	2-14MB EXP BRD w/2MB	34F3077	\$577	
	4-16MB EXP BRD w/4MB	34F3011	\$975	
80-041	1MB BOARD	6450375	\$ 675	\$ 135
80-041, 071	2MB MODULE	6450372	\$1,295	\$ 429
80-A21, A31	4MB BOARD	6451060	\$1,895	\$ 694
80-All Models	1MB MODULE	6450603	\$ 450	\$ 89
	2MB MODULE	6450604	\$ 950	\$ 175
	4MB BOARD	6450379	\$ 950	\$ 249
	4MB MODULE	34F2933	\$2,195	\$ 722
PORTABLE P70	2MB MODULE	6450604	\$ 950	\$ 175
4019/E	1MB MODULE	1039136	\$ 450	\$ 139
LASER	2MB MODULE	1039137	\$ 850	\$ 185
PRINTER	3.5MB MODULE	1038675	\$1,495	\$ 269

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	4MB MODULE	113132-001	\$1,950	\$ 295
DESKPRO 386/16	1MB KIT	108071-001	\$ 635	\$ 85
	4MB KIT	108072-001	\$2,550	\$ 295
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	4-8MB EXP BRD w/4MB	108070-001	\$2,550	\$1,236
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	1MB BOARD	113833-001	\$ 650	\$ 285
	4MB MODULE	112534-001	\$1,950	\$ 295
	4MB BOARD	113634-001	\$2,395	\$ 595
DESKPRO 386/20, 25	1MB MODULE	113131-001	\$ 450	\$ 85
	4MB MODULE	113132-001	\$1,950	\$ 295
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	4MB BOARD	107653-001	\$2,395	\$ 990
	4MB EXT BOARD	107654-001	\$2,395	\$ 985
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	2MB KIT	107332-001	\$1,100	\$ 164
PORTABLE LTE	512K BOARD	117077-001	\$ 295	\$ CALL
	1MB BOARD	117081-001	\$ 650	\$ 95
	2MB BOARD	117081-002	\$1,250	\$ 195
SLT/286	1MB BOARD	110235-001	\$ 650	\$ 135

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IIcx	4MB KIT	MO292LL-A	\$ 950	\$ 259
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IIcx	1MB KIT	MO218	\$ 250	\$ 89
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IIfx	4MB KIT	MO376LL-A	\$ 950	\$ 348
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LASERWRITER II/NTX	1MB EXP KIT	M6005	\$ 450	\$ 79
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	2MB KIT	500510-002	\$ 345	\$ 159
BRAVO 386SX	512K KIT	500510-010	\$ 135	\$ 54
	2MB KIT	500510-002	\$ 345	\$ 169
PREMIUM 286 ADVANCED	1MB KIT	500510-007	\$ 280	\$ 89
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PREMIUM WS286/WS386SX	512K KIT	500510-010	\$ 135	\$ 54
	2MB KIT	500510-002	\$ 345	\$ 169
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6386/SX, 6386/25&33	2MB UPGRADE	37336	\$1,195	\$ 200

EPSON				
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	1MB KIT	A808231	\$ 450	\$ 142
	2MB KIT	A808101	\$ 995	\$ 212
386SX	1MB KIT	A808231	\$ 450	\$ 142
	2MB KIT	A808101	\$ 995	\$ 212

HP VECTRA SYSTEM				
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	2MB KIT	D1354A	\$1,195	\$ 162
	4MB KIT	D1542A	\$2,495	\$ 325
VECTRA ES/12PC	2MB KIT	D1354A	\$1,195	\$ 162
VECTRA QS/20S, RS/25PC	1MB KIT	D1640A	\$ 595	\$ 115
	4MB KIT	D1642A	\$2,495	\$ 342
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	2MB BOARD	H334458	\$1,450	\$ 259
LASER JET HP, M	0MB BOARD	H334748	\$ 485	\$ 99
	1MB BOARD	H334758	\$ 890	\$ 120
	2MB BOARD	H334768	\$ 1,278	\$ 175
	4MB BOARD	H334778	\$ 3,329	\$ 278

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POWER MATE 386SX	4-8MB EXP BRD		\$2,295	\$ 842

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T1600	2MB BOARD	PC8-PA8302U	\$1,190	\$ CALL
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	4MB KIT	ZA3800-MK	\$2,695	\$ 660
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	1MB BOARD	7PC-16AC		\$ 288
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AVRON SERIES	4MB BOARD		\$3,000	\$1,746

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DECStation 2100, DECStation 3100	4MB KIT	MS01-AA	\$2,500	\$ 650
VAXStation 3100, MicroVAX 3100	8MB BOARD	MS42-KA	\$3,995	\$1,280
	12MB ADD-ON	MS42-BA	\$5,995	\$1,730
	12MB EXP BRD		\$5,995	\$2,250
	16MB BOARD	MS42-CA	\$7,950	\$2,380
VT100 TERM, VT100 BOARD	1MB BOARD	VX10X-MA	\$ 395	\$ 315
	1MB MODULE	VX10X-MD	\$ 395	\$ 289

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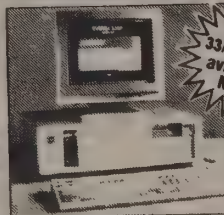
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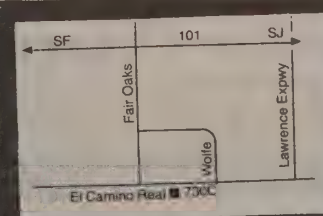
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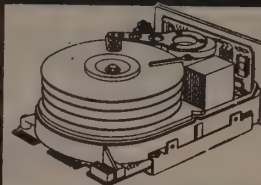
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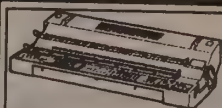
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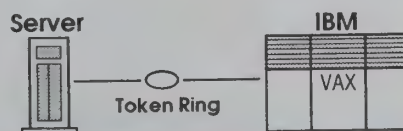
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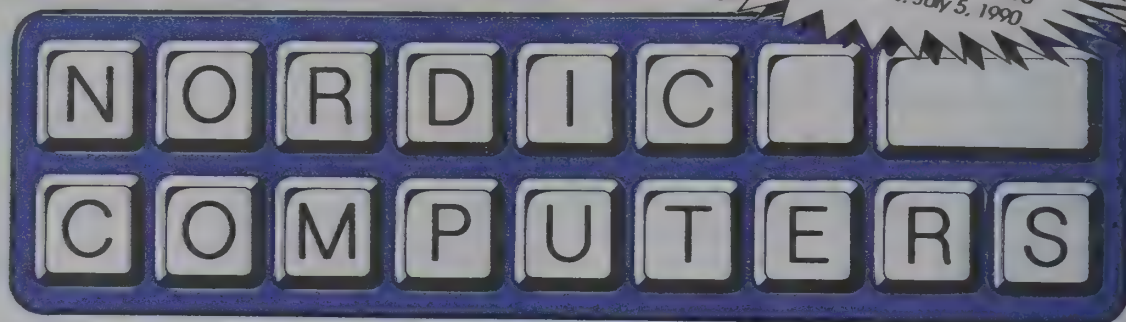
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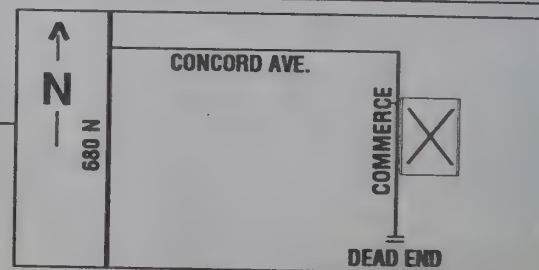
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Continued from page 26

impervious to a recession, and this year could be a bloodbath. In previous recessions, younger companies with high debt were the first to go, and with the banks in as bad shape as they are this year, we can expect to see many little companies fall by the wayside. But this could be the year that the larger companies start to get very worried too.

A good sign of how bad things might get is AT&T's recent bid for NCR. AT&T has finally come to grips with the fact that its computers are obscure, overpriced, and not what the customers want. So it tried to buy NCR, another giant with a product line that is strong but not terribly innovative. When NCR refused, the "hostile" takeover took a bizarre turn: AT&T said that NCR executives could stay, that NCR could take over what was left of AT&T's computer product line, and that AT&T employees would be the first to go. AT&T then jacked up the bid to \$90 a share, something that had many Wall Street analysts laughing out loud. If the bid is successful, AT&T will be straddled with billions in debt; if it fails, no one in the computer industry will take AT&T seriously ever again.

Debt isn't going to be the only thing that takes down industry leaders. Ashton-Tate got a very rude awakening as 1990 closed in the form of a judge who ruled that "Ashton-Tate's copyrights on its dBase line of computer software products are invalid as a result of inequitable conduct." The conduct in question was repeatedly omitting significant facts in its dealings with the US Copyright Office, even though these facts were common knowledge in the micro industry.

Ashton-Tate stock took an immediate nosedive, although appeals will surely follow. It should be noted that the ruling came in a case that Ashton-Tate brought against smaller competitors it wanted to put out of business.

Other large companies could find an unhappy year in 1991. Apple, Microsoft, and Hewlett-Packard are still in court, and Lotus and Borland are still in court, although all of the above are relatively free from debt that might topple smaller companies. The middle tier of companies will certainly be forced into heavy layoffs and large cuts in R&D. Depending on how much the S&L debacle drains from the economy, how many lives and how much money are lost in the Persian Gulf, and how business feels about the future with all that going on, 1991 may be the year the market turned south.

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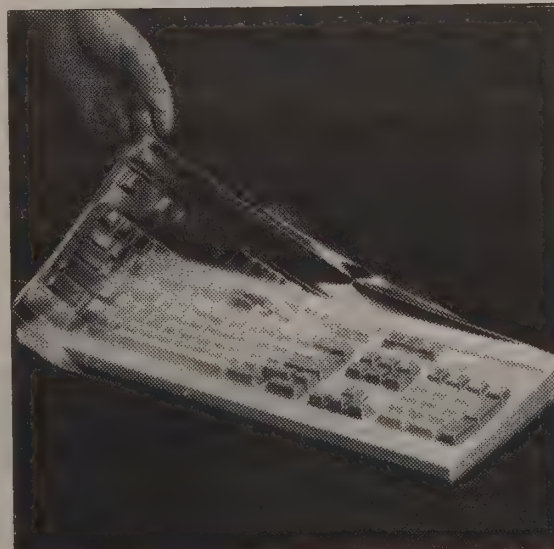
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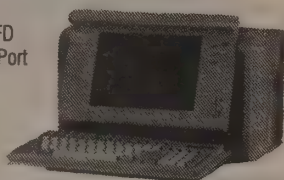
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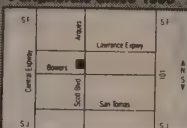
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NEWS & VIEWS

HIGH TECH NEWS FROM JAPAN

ASCII, the giant microcomputer software and publishing company, has invested million in Nexgen Microsystems, a Califor

Fujitsu
announced that it
has formulated a
new light plastic
for notebook PC
cases that is
twice as strong
and four times as
elastic as ABS
resin.

nia chip-maker. Nexgen is working on an 80486-compatible chip that will run much faster than current Intel chips. Other Japanese investors in Nexgen include Mitsui and Yamaha.

Hitachi has developed a CD-ROM player based on the CD-ROM/CA standard. The player, which is still unpriced and does not yet have a commercial release date, has a 640x480 LCD screen capable of 256,000 colors, an input tablet, and a 16-bit DSP (digital signal processor). It is housed in a very small box that is easily carried.

NEC has started an English/Japanese and Japanese/English electronic mail translation service based on its EWS4800 translation workstation. Translation costs about \$25 for the first 350 words and \$10 for each 150 words after that. The workstation includes huge dictionaries of specialized terms so even technical documents can be translated. NEC says that it expects 24-hour turnaround on all jobs.

Fujitsu announced that it has formulated a new light plastic for notebook PC cases. The new resin is twice as strong and four times as elastic as ABS resin, the current favorite of many manufacturers. ■

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

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ing a RAS or a CAS cycle. Sometimes my detector says that you have to have both a RAS and a CAS cycle. Therefore, it's a statistical speedup depending upon the percentage of RAS cycles you can drop on the average and the percentage of CAS cycles you can drop on the average.

What percentage of an ordinary read would be eliminated? [Note: The familiar nanosecond ratings applied to memory chips, such as 100 or 80 nanoseconds, refer to the chip's access time. The following discussion refers to longer times that are required for a full memory cycle including recharge and other operations.]

A lot of that depends upon the type of system you're working with. In a display system where I configure it in a two-dimensional memory-mapped array, I can get about a 90-95% scan out, or CAS cycles, without any RAS cycles at all. If you drop the RAS cycles and go only CAS cycles, you get 350% faster. If you drop the RAS and CAS cycles, and do the scan out, you can go 625% faster.

But then there's a statistical averaging, because eventually, you're going to need a CAS cycle. Eventually you're going to need a RAS cycle. Depending upon the system, I come out with some weighted average up to 300% improvement in speed. In certain cases, like two-dimensional memory maps as used for display applications, you can get something close to 600% improvement. You can go from a 180-nanosecond full cycle to 65-nanosecond CAS-only to a 35-nanosecond neither-RAS-nor-CAS cycle.

This sounds like an obvious thing to do, and it's surprising that nobody's done it up to now.

Well, that's one of the big problems, and I'd like to tell you a little story about this.

My talent is in coming up with simple solutions to difficult problems. And this is very frustrating because a lot of times I will tell someone what I can do, without telling them how I'm going to do it, and he'll say, "That's impossible." Then, I tell him, "Well, this is how

I'm going to do it," and the guy looks at me and says, "Well, that's obvious." So, it goes from being impossible to obvious and I can't win.

Same thing with the microcomputer, I was trying to get my company funded, and these guys said, "It's ridiculous to form the company to build a cheap computer. Everyone knows you can't build a computer for under \$1,000. The core memory will cost you more than that."

"I don't use a core memory."

"That's ridiculous. You've got to have a core memory. It's a computer."

"Well, I'm using a ROM and a RAM in this configuration."

"Oh, sure, that's obvious."

That's the subject of conversations I had back in the '68 time frame.

So, are people starting to take you more seriously now that you've got '516?

Yes.

So what's next? You're only 52 years old. You have a lot of productive years left.

It's not what I'm going to do, it's what I am doing and have been doing. I've got some real blockbuster technology in the development lab, and I'm waiting to continue the development on it. As royalties start flowing in, I'll be able to hire people to help me and get these products to market.

Are you sure you're not just going to say, "Well, look, I'm wealthy enough now. I'm going to retire and go live in the Bahamas"?

That would have been easy to do by selling off my patents. I could have made enough off of it to do whatever I want to do. What I want to do, really, is to get enough capital in to fund the research and development on a bigger scale, and to help the individual inventors that I feel are a key factor in regaining America's competitive position in the world market. ■

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Continued from page 214

[Exp. #83.]

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #80.]

MUSIC

MuSIG. Meetings: 1st Sun., 2:00 pm. Various locations. Call: (415)858-1493. [Exp. #79.]

NETWARE

Central Valley NetWare User Group. Meetings: To be determined. Call: Rick Uttley, (209)825-7063. [Exp. #78.]

NEURAL NETWORK

Neural Network User Group. Call: David (415)644-2369. [Exp. #79.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)453-3321. BBA (408)453-3326. [Exp. #83.]

OS/2

Smalltalk VPM Experts. Meetings: 3rd Thurs., 7:30 pm. Call:

Dave Hurrell, (408)866-4647. [Exp. #81.]

PARADOX

Paradox SIG/SFPCUG. Meetings: 3rd Mon., 6:15, UCSF, 333 California St., San Francisco. Call: Richard Haven, (415)566-8076. [Exp. #83.]

San Francisco Paradox User Group: BAPALS. Meetings: 4th Tues., 4:00 pm, SF State Downtown Center, 814 Mission St., Suite 206. Call: Brad Jung, (415)287-5833. [Exp. #78.]

PROGRAMMING LANGUAGES

Smalltalk/V User Group. Meetings: Last Thurs., 6:30 pm. Call: David Freihofner, (415)362-4283. [Exp. #78.]

Smalltalk/V SBUG (South Bay User Group). Meeting: 2nd Thurs., 7:00 pm. Call: Dave O'Neal, (408)929-1969. [Exp. #78.]

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East Bay R:Base User Group. Meetings: 4th Thurs., 8:30 am, Call: David, (415)548-4927. [Exp. #79.]

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9:00 am. Call: Longwell Assoc., (415)451-5316. [Exp. #80.]

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UNIX/XENIX

UNIX SIG/SFPCUG. Meetings: Last Wed., 7:30 pm, Call: John Tait, (415)386-9230. [Exp. #83.]

UNIX/XENIX User Group Of N. CA. Meetings: Call: Ren Just, (707)664-0820 or BBS (707)795-1721. [Exp. #83.]

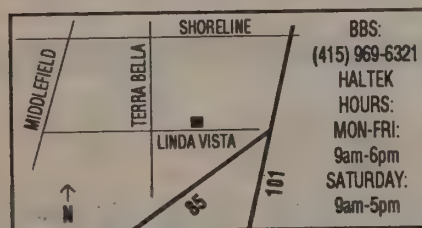
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A.J. COMPUTER SUPPLIES 170	BUSH COMPUTERS 149	ELESYS 65	PARS INTERNATIONAL
ACCESS COMPUTER	C & J COMPUTER SYSTEMS 183	ELITE TM INDUSTRIES 153	COMPUTER 109
TECHNOLOGIES 114-117	C2 MICRO SYSTEMS 77	EMPAC INTERNATIONAL 74,75	PC & T 236
ACCURA PCB DESIGN 104	CENTRAL COMPUTER SYSTEMS 168,169	ESPANORE LTD 179	PC BY ROOT 101-103
ACR SYSTEMS 155	COMPULAN 48	EVERGREEN COMPUTER INT'L 68,69	PC WAREHOUSE 6
ADOLPH GASSER 170	COMPUTER ART 108	FRY'S ELECTRONICS 2,119-132,239	PETER J. PHETHEAN, LTD. 21
ADVANCE COMPUTER SYSTEMS 4,5	COMPUTER	GENERIC COMPUTER SYSTEMS 228	PILLARCO 18
ADVANCED SYSTEM TECHNOLOGY 140	DEVELOPMENT SYSTEMS 42	GOLDEN VALLEY TECHNOLOGY 189	PORTAL MICROSYSTEMS 8
ALPHA FINE COMPUTER FURNITURE 26	COMPUTER SELECTION 28-31	GREAT ADVANCE	POWERSOURCE
AMERICAN COMPUTER SYSTEMS 3	COMPUTER SWAP 136	TECHNOLOGY CORP 177	COMPUTER SYSTEMS 158
AMERICAN DIGITAL DATA ASSOC. 182	COMPUTER WERX 100	GREENLEAF INTERNATIONAL 151	PRECISION COMPUTER
AMT INTERNATIONAL 20,21	COMPUTERLAND OF SERRAMONTE 27	GUENTHER COMPUTER	TECHNOLOGY 156,157
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ASP COMPUTER PRODUCTS 188,190	DATA ONE 142	HI-TECH USA 167	ROGER WILLIS COMPUTERS 191
ATICO 221	DATAWEST COMPUTERS 143	HYPER COMPUTER 59	SANS EGAL, INC. 136
ATMAN COMPUTERS 56,57	DEMO SOURCE 72	ICS COMPUTERS 199	SANTRON COMPUTERS 12,13
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TECHNICAL SERVICES 198	DISCOUNT MICRO WORLD 193	MICRONET SYSTEMS 229	SERVTEL 76
AVIA 220	DOMINO SELF SERVICE CENTER 10,11	INTO COMPUTER 49	SF MICRO 213
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		JEMINI ELECTRONICS 202,203	SOFT WAREHOUSE 107
		KIMEX CORPORATION 228	SONGTECH INTERNATIONAL, INC. 207
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		KRIS TECHNOLOGIES 22	SUNLIGHT COMPUTER PRODUCTS 73
		LIU COMPUTER/KINGSTAR 17	SURAH 15
		LOGITECH 34	SYSPER TECHNOLOGY 60,61
		MA LABORATORIES 208	TANSTAAFL MANUFACTURING, INC. 40
		MAC OUTLET CORPORATION 194	TECHNOLAND 135
		MCTEK SYSTEMS 148	TEK COMPUTERS 147
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		MICRO LINKS DISTRIBUTION 54	TOTAL PUBLIC DOMAIN 231
		MICRO STRATEGIES 41	TOTE-A-LAP 63
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		MICROLINK SYSTEMS INC. 144,145	TSL CORPORATION 7
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		MITSUBA 38	UNCLE RALPHS 161-163
		MS ENGINEERING 24,25	UNIVERSAL COMPUTER PRODUCTS ... 215
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		NATIONAL DISKETTES 8	VICTS TECHNOLOGY 98
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		NETWORK INNOVATIONS 81	VISION ARTS 165
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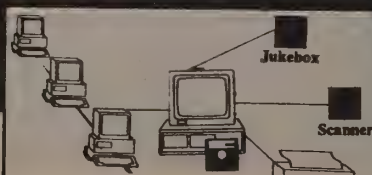
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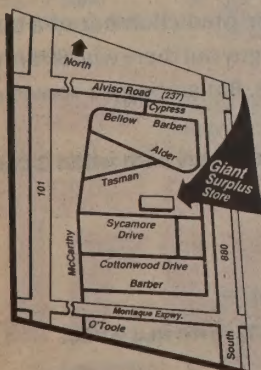
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Predictions, Predictions, Fads, Fashions And Mania

or The Annual Carnival Of Malarkey—1991 Edition

BY JOHN C.
DVORAK

This is the sickening time of year when all the experts come out of their holes and predict the future. Or at least they predict what will happen in 1991—the immediate future. Magazines run quotes from a slew of experts, each making a prediction in exchange for free publicity.

I'm never sure what's worse: all these predictions or the trite "What's HOT and What's NOT!" features that show up in the daily newspapers. It's a battle between these two kinds of features to see what reporters or editors get the annual "PRETENTIOUS? Moi?" Award secretly handed out by the Pulitzer Committee.

These crappy staff-written hot lists have to make you wonder. Since when is a staff writer on a local daily newspaper an insightful trend-spotter with a lock on fashion and fad? Seems unlikely, if you ask me. Have you ever seen the way reporters dress?

Then there's the "BEST of WORST of" features and the clichéd

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DUBIOUS ACHIEVEMENT AWARDS. Ho ho ho. Don't we feel superior! Of course, I've taken part in many of these charades, so maybe I should shut up myself.

Whatever the case with the public press, the computer press and the high technology scene is even worse with this stuff. Let's make an example out of an interesting prediction I ran into the other day. It was given by one of the top broadcasting experts:

"Conceivably between 3,000 and 4,000 FM stations can operate successfully in continental US without undue overcrowding."

"Why so many stations? The reason of course is that the effective transmitting radius of an FM station is its optical horizon—in flat country from 25 to 35 miles, in hilly or mountainous regions from 35 to 100 miles. The topography in the US being preponderantly level, it follows that over 85% of the FM stations will have an effective transmitting range of only an average of 35 miles radius. Hence many more transmitters are needed to cover the entire country."

"The present trend indicates that in a foreseeable time the US will undoubtedly be converted from AM to FM. The reason is simple: once a radio set buyer has listened to the much clearer, practically noiseless and staticless radio reception of an FM receiver, he will shy away from AM. This is indeed what is now happening all over the US. It also explains the present FM boom, both in transmitters being erected and receivers sold."

"At one time it was thought that FM would be a completely independent adjunct to radio broadcasting in America. It was felt then that every FM station would disseminate its own programs, or that there would be a country-wide high-fidelity FM network which would actively compete with AM stations and AM networks. This did not come about, although there are of course many independent FM stations which originate their own programs..."

"That the public's listening trend is unmistakably toward FM is clearly shown by the radio receiver manufacturers."

"How long will it be till the entire US broadcasting facilities have been completely converted to FM? From about 8-10 years might be a conservative estimate for 85% to 90% of our transmitters."

This predicted end of AM radio was made by a guru named Hugo

I'm never sure what's worse: all these predictions or the trite "What's HOT and What's NOT!" features that show up in the daily newspapers. It's a battle between these two kinds of features to see what reporters or editors get the annual "PRETENTIOUS? Moi?" Award secretly handed out by the Pulitzer Committee.

Gernsback who published a magazine called *Radio Craft*. The above observation was published in the June 1948 issue of the magazine.

This technique of quoting some old off-base prediction is, of course, a writer's trick that never fails. Quoting Karl Marx back to the diehard Communists is a cheap trick good for a laugh too. What is always overlooked in this exercise in humiliation is the fact that, with few exceptions, most prognosticators can be easily proven wrong time and time again, whenever they attempt any kind of long term predication.

I once said that the only seemingly accurate predictions—especially in high technology—are made by people parading inside information around as though it were insight. Predicting that IBM will come up with UNIX on a chip when you have already been briefed about UNIX on a chip is hardly a prediction. If you are unlucky enough to attend those expensive pundit-loaded affairs where expert after expert appears to give you the insight you need to become rich and famous, then you should be long since aware that nobody knows what they're talking about when it comes to the future. Nobody. This includes futurists like Toffler and Naisbitt and the rest of them.

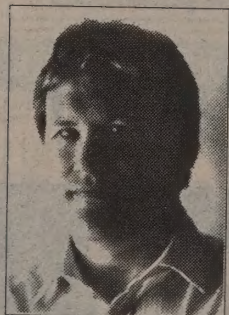
I still feel bad for the programmers and developers who took to heart the advice of all the great seers who predicted wondrous things for OS/2 in 1990. "Develop code for OS/2, not WINDOWS!" one guy said. Free advice is worth what you pay for it, but I think some people actually paid for this advice too. Alas.

Now none of this is to say that one prediction out of a hundred won't be right or that there isn't some guy out there who is more often than not good at foreseeing the future. But amongst a snowstorm of predictions, how can you tell?

I think there are rules that you have to stay with when it comes to the computer business:

- 1) You can't predict the future.
- 2) Things get smaller, cheaper and faster.
- 3) Expect to be surprised by something once in a while.

That's about it. Other than that, it's all a crock. ■



© 1991 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine and MacUser, and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.

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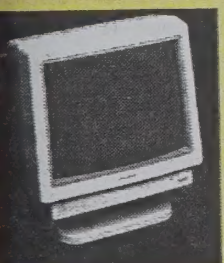
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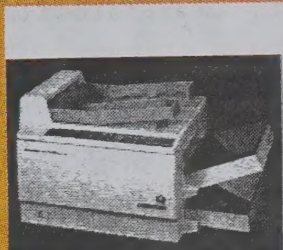
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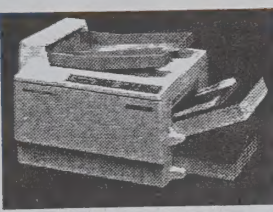
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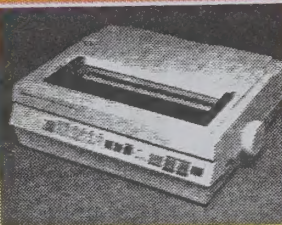
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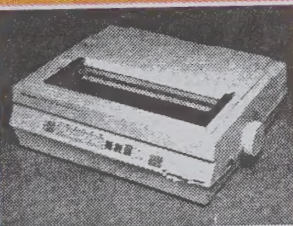
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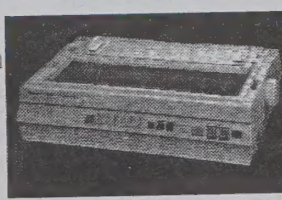
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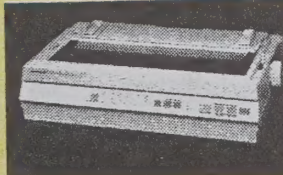
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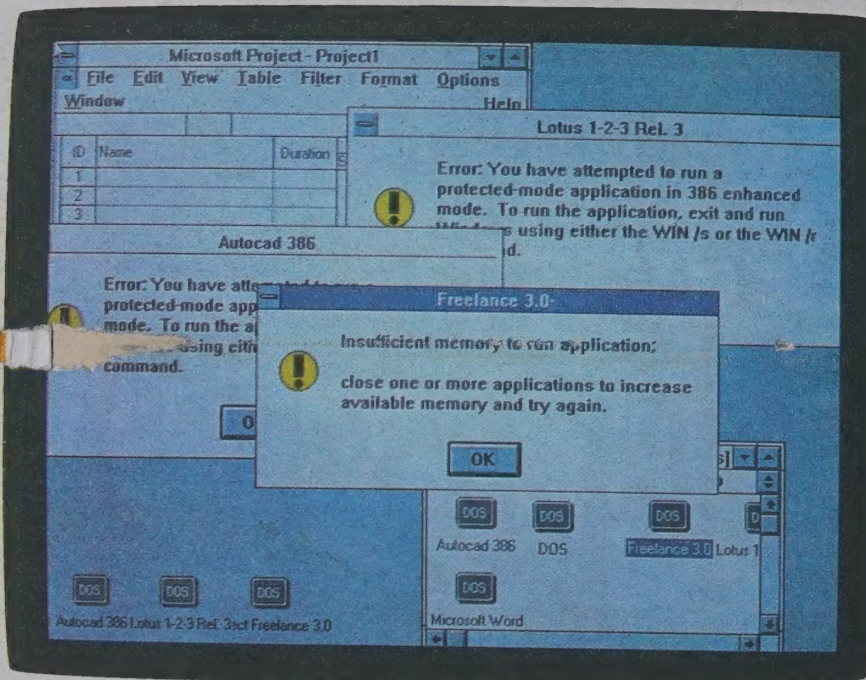
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This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev. A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

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